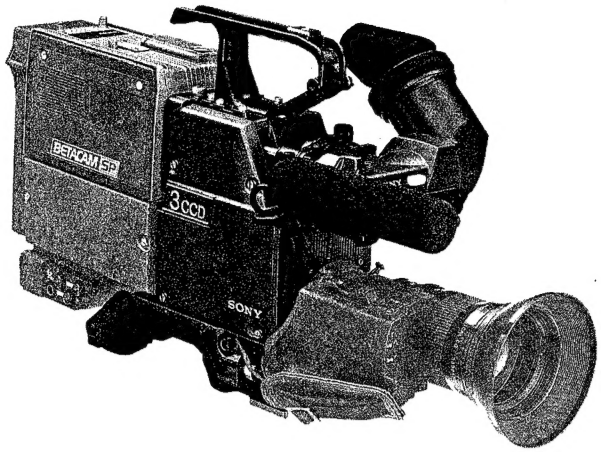
SONY

COLOR VIDEO CAMERA

BVP-70P
BVP-70ISP



BETACAM™

MAINTENANCE MANUAL

3rd Edition (Revised 4)

Serial No. 40386 and Higher (BVP-70P)

Serial No. 41001 and Higher (BVP-70ISP)

EBU N-10 LEVEL

SAFETY RELATED COMPONENT WARNING

Components identified by shading and ⚠ marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

For the Customer of the BVP-70ISP Color Video Camera

This maintenance manual is for both the BVP-70P and BVP-70ISP color video cameras. All explanations in this operation manual apply to both cameras though refer only to the camera as "BVP-70P". Note also that the BVP-70P and BVP-70ISP share the same features except for the following sensitivity feature.

High sensitivity of BVP-70ISP

The BVP-70ISP provides a sensitivity two times greater than the BVP-70P. Therefore, you can get a clear video image even in places where Illumination is low.

Sensitivity: 89.9% reflection chart, 2,000 lux (F8)
Minimum Illumination: 7.5 lux (at F1.4, + 18 dB gain)

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A. BLOCK DIAGRAMS

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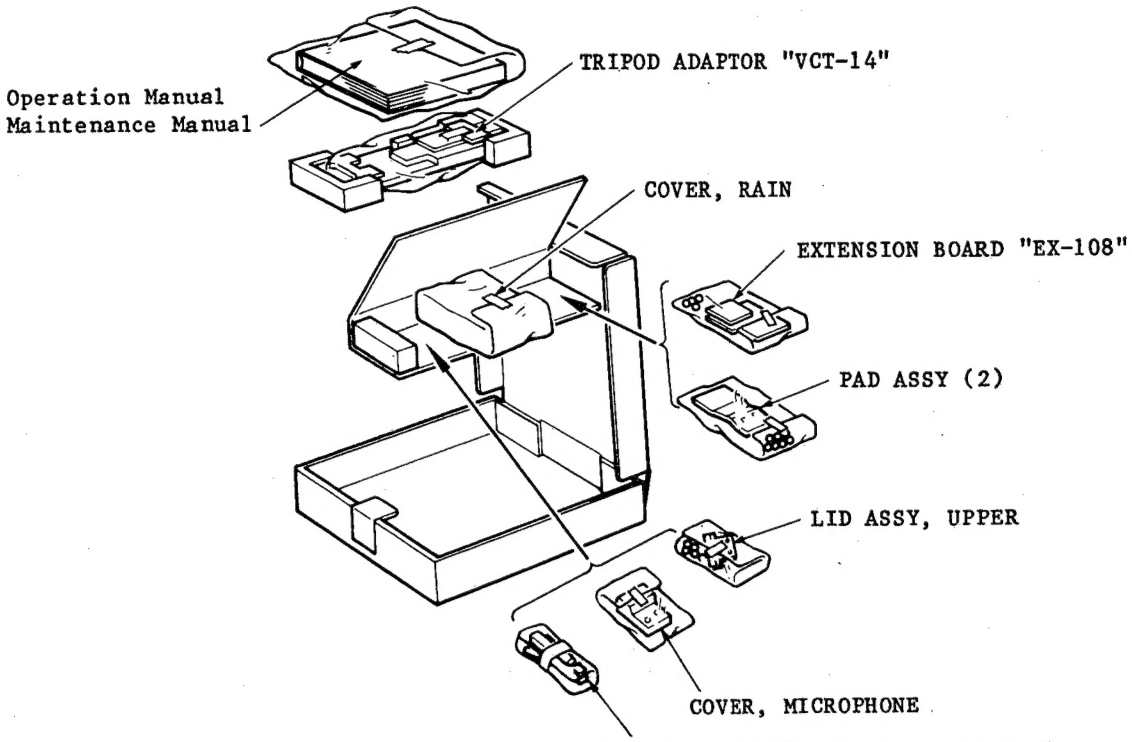
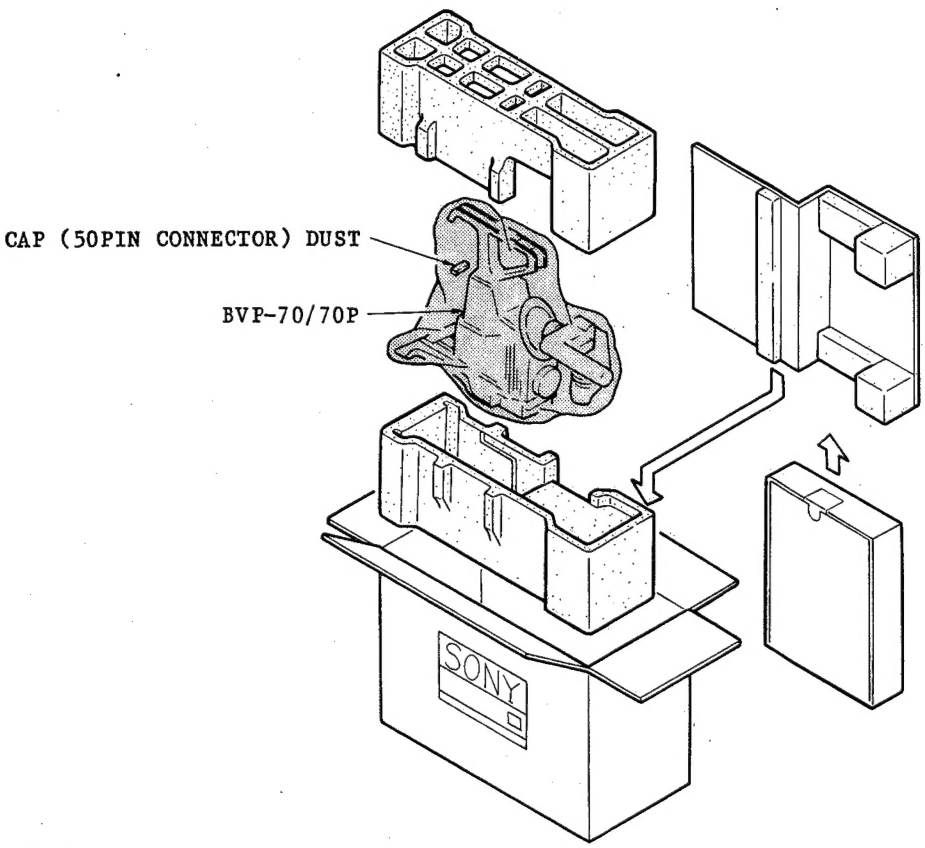
SECTION 1
INSTALLATION

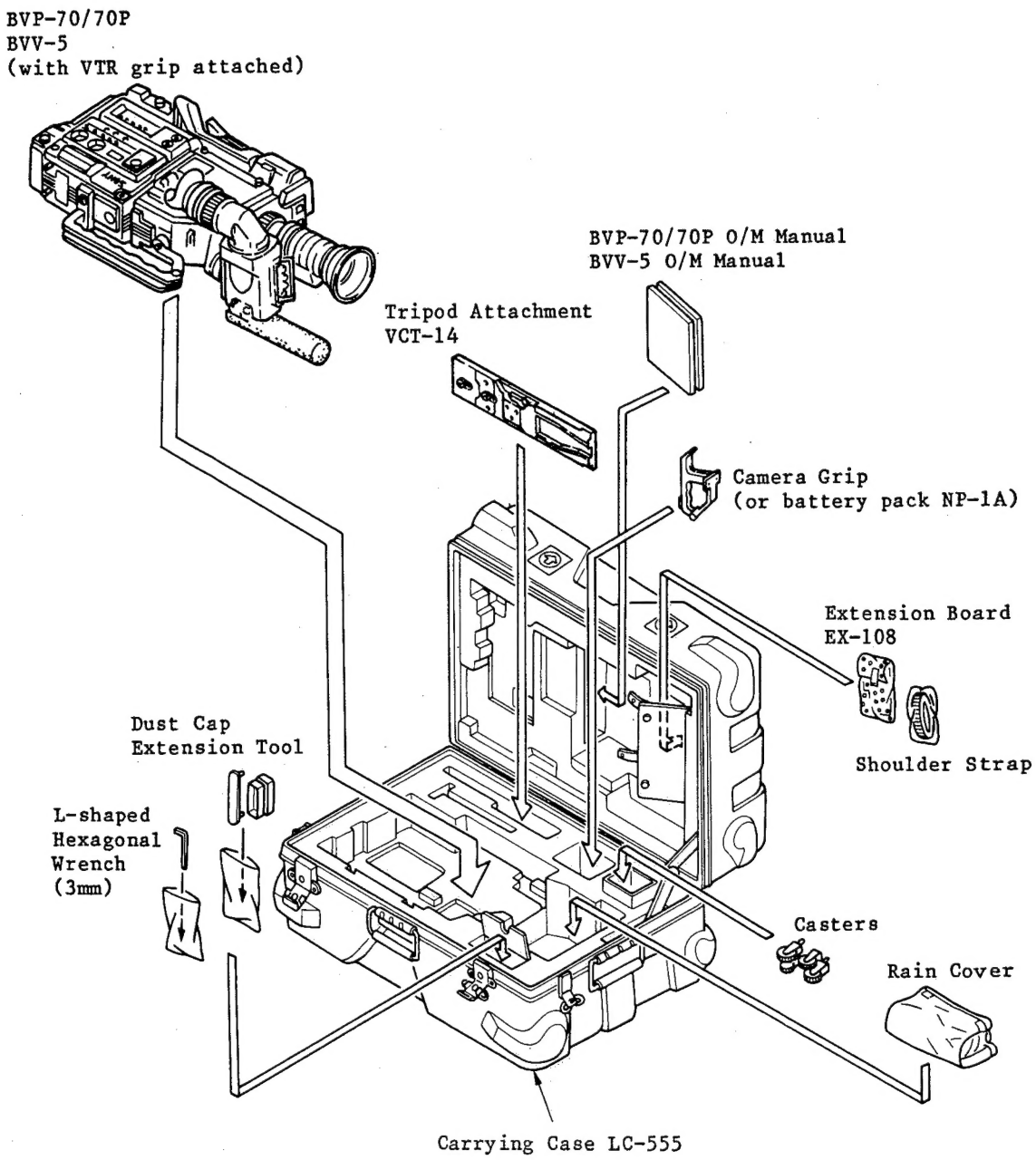
1-1. UNPACKING AND REPACKING





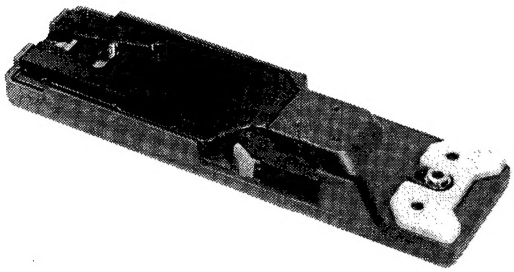
1-2. REPACKING IN CARRYING CASE

The camera and VTR can be stored in the carrying case with the lens and viewfinder attached. This will protect the camera from the damage caused by outside pressure.

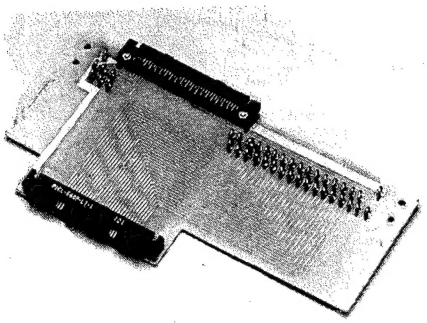


1-3. SUPPLIED ACCESSORIES

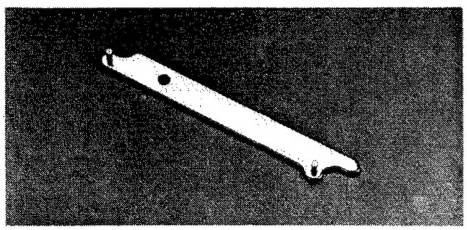
. Tripod attachment "VCT-14": x 1
This is the fixed mount for the attached camera at the tripod.



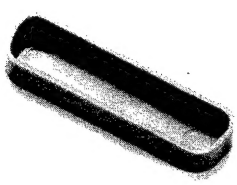
. Extension Board "EX-108": x 1
Use this for the check and repair of the main printed boards. (IE-25/25P board, VA-85 board, PR-138A/138B board, EN-69/69P board, and PS-224 board)



. Extension tool: x 1
Use this when pulling out the printed board in the card rack.

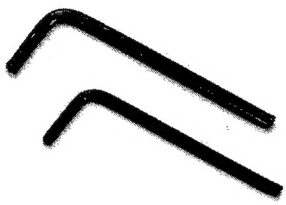


. Dust Cap, 50-pin connector: x 1

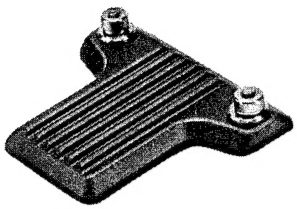


. Dust cover : x 1

. L-shaped Hexagonal wrench (3mm): x 1
(2mm): x 1
Used for fixing or removing screws of the handle assy.

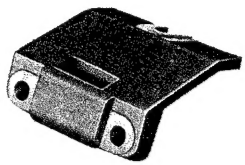


. LID ASSY, Upper : x 1



. Screw, Blind : x 2
After removing the handle assy of the camera, used for closing the hole on the upper cover.

. Cover, Microphone: x 1
When the supplied microphone is detached from the viewfinder, attach this to protect the viewfinder from rain.



. Cover, BNC: x 1

. Operation Manual : x 1
Instruction manual for BVP-70/70P.

. Maintenance Manual : x 1
Service Manual for BVP-70/70P.

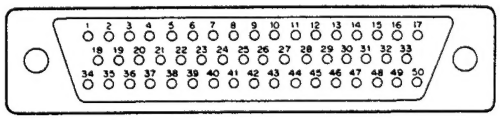
1-4. CONNECTORS/CABLE

1-4-1. Connector Input/Output signals

The main connector input/output signals are as follows;

TEST OUT VS signal 1Vp-p
          Zo = 75Ω

50-PIN CONNECTOR



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	GEN LOCK IN (X)	VBS 1 Vp-p, Zi=1 kΩ
2	GEN LOCK IN (G)	
3	+8.8 V OUT	REG (+8.8 V)
4	−5.0 V OUT	REG (−5.0 V)
5	UNREG (GND)	GND for UNREG
6	UNREG (GND)	
7	R VIDEO OUT (X)	V 0.7 Vp-p, Zo=75Ω
8	G VIDEO OUT (X)	
9	B VIDEO OUT (X)	
10	RGB VIDEO OUT (G)	GND for R, G, B VIDEO
11	(Spare)	
12	(Spare)	
13	(Spare)	
14	SD IN/OUT	Serial data for camera control
15	MIC OUT (G)	Zo≦600Ω, −60 dBm balanced
16	MIC OUT (X)	
17	MIC OUT (Y)	
18	RET VIDEO IN (X)	V 0.7 Vp-p, Zi=1 kΩ
19	RET VIDEO IN (G)	
20	ZEBRA/AUDIO IN	AUDIO Zi≧1 kΩ
21	(Spare)	
22	TAPE IND 2 IN	ON: +4.5 V, OFF; GND or OPEN
23	TAPE IND 1 IN	

PIN No.	SIGNAL	REMARK FOR SIGNAL
24	REC ALARM IN	ON: +5 V, OFF: +2.5 V or 0 V, Zi≧20 kΩ
25	BATT IND IN	Note 1), Zi=300Ω
26	PB REF IN	PB: +4.5 V, CAM: 0 V or OPEN
27	VTR START/STOP OUT	Note 2), Zo≦10 kΩ
28	(Spare)	
29	R-Y VIDEO OUT (X)	V 0.7 Vp-p, Zo=75Ω (BVP-70) V 0.525 Vp-p, Zo=75Ω (BVP-70P)
30	R-Y VIDEO OUT (G)	
31	AUDIO CONT OUT	0 V (0 dB) ~ 7 V (−20 dB)
32	VTR SAVE OUT	SAVE: +4.5 V, STAND BY: 0 V, Zo≦10 kΩ
33	AUDIO MONITOR IN	No connection
34	SYNC (VTR) OUT	5 Vp-p, Negative pulse, Zo≦100Ω
35	(Spare)	
36	SHUT CLOSE IN	No connection
37	CF OUT	Color Framing
38	RET VIDEO ENABLE OUT	ENABLE: 0 V, DISABLE: +5 V or OPEN
39	UNREG IN	+10.6 V ~ +17 V
40	UNREG IN	
41	Y VIDEO OUT (X)	VS 1.0 Vp-p, Zo=75Ω
42	Y VIDEO OUT (G)	
43	VBS OUT (X)	VBS 1.0 Vp-p, Zo=75Ω
44	VBS OUT (G)	
45	(Spare)	
46	(Spare)	
47	(Spare)	
48	(Spare)	
49	B-Y VIDEO OUT (X)	V 0.7 Vp-p, Zo=75Ω (BVP-70) V 0.525 Vp-p, Zo=75Ω (BVP-70P)
50	B-Y VIDEO OUT (G)	

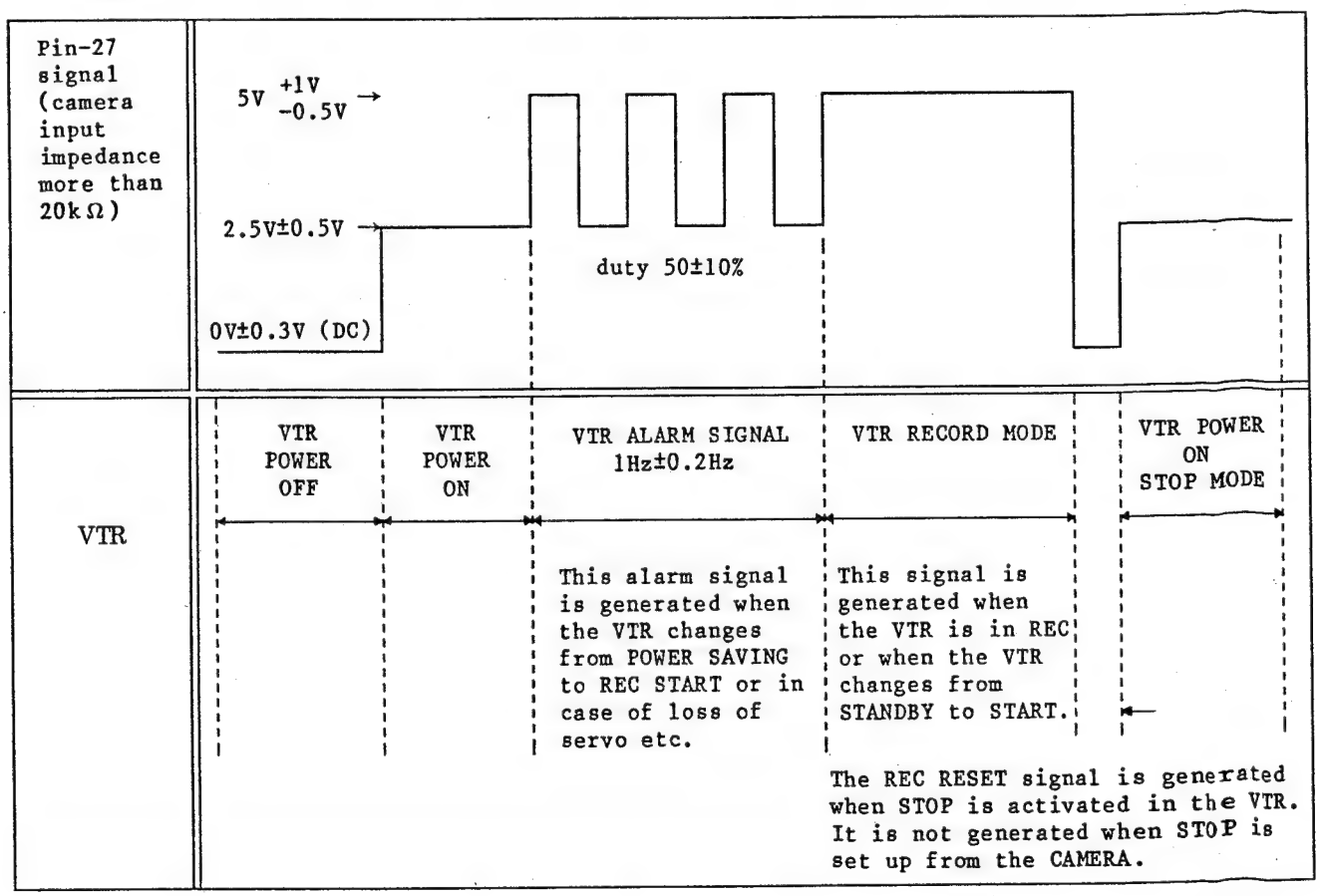
Note. 1 Signal at Pin 25

Battery voltage detection and warning signal generating circuits are located within the VTR. This signals are supplied from the VTR to the camera to either blink or light the LED at the bottom of the viewfinder.

BATTERY TERMINAL ADAPTOR (VTR INTERNAL BATTERY)	DC12V to 11.1V	DC11.1V to 10.8V	PIN 25 TURNS HIGH AT DC 10.8V. 10.6V DC or below the VTR Internal Power is cut off so that the Battery Power is sent to Pin 25.
PIN 25 OUTPUT FROM VTR	0 V	1Hz±0.2Hz duty 50±10%	DC2 to 3V across 300Ω
LED IN VIEWFINDER	NEITHER BLINKS NOR LIGHTS	BLINKS AT 1Hz	LIGHTS

Note. 2 Signal at Pin 27

When the VTR is ON , the input to the camera at pin 27 is 2.5V DC. In VTR record mode the voltage is 5V DC. When servo is not applied or if alarm signals are generated within the VTR, an alternating 1Hz signal (2.5Vp-p with 2.5V DC as reference) is sent to the camera. At the tape end when the VTR enters Stop mode or when setting up the Stop mode from the VTR, 0V DC is generated from 10msec to 100msec (called REC RESET). After REC RESET the signal level returns to 2.5V DC.



VF (20P)

(EXT VIEW)

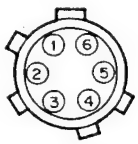
PIN No.	SIGNAL	REMARK FOR SIGNAL
1	FILTER 1 OUT	ON: +5 V, OFF: 0 V or OPEN
2	FILTER 2 OUT	
3	FILTER 3 OUT	
4	FILTER 4 OUT	
5	GAIN UP IND. OUT	ON: +5 V, OFF: 0 V or OPEN, +9 dB: Zo=7 kΩ +18 dB: Zo=1 kΩ
6	CCIR/EIA OUT	CCIR: +8.8 V, EIA: 0 V, Zo=1 kΩ
7	AUTO IND. OUT	ON: +5 V, OFF: 0 V or OPEN, Zo=470 kΩ
8	TAPE IND. 1 OUT	ON: +4.5 V, OFF: 0 V or OPEN, Zo=330Ω
9	TAPE IND. 2 OUT	
10	MIC IN (G)	GND for MIC
11	ZEBRA/AUDIO IN/OUT	ZEBRA ON: 0 V, OFF: +5 V or OPEN AUDIO: Zo≦30Ω, −15 dBs±1 dB
12	VF VIDEO OUT (X)	VBS 1 Vp-p, Zo≦100Ω
13	AUDIO CONT IN	0 V (0 dB) ~ +7 V (−20 dB)
14	MIC IN (Y)	Zo≦600Ω −60 dBm balanced
15	MIC IN (X)	
16	BATT IND. OUT	ON: +4.5 V, OFF: 0 V or OPEN, Zo=330Ω
17	REC/TALLY OUT	ON: +8.8 V, OFF: 0 V or OPEN
18	+9.3 V (VF) OUT	REG+9.3 V
19	GND	GND
20	UNREG OUT	+10.6 V ~ 17 V

LENS (12P)

(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	RET VIDEO ENABLE IN	ENABLE: 0 V, DISABLE: +5 V or OPEN
2	VTR START/STOP IN	TRIGGER 5 Vp-p
3	GND	GND for UNREG
4	AUTO +5 V OUT	AUTO: +5 V, MANU: 0 V or OPEN
5	IRIS CONT OUT	+3.4 V (F16) ~ +6.2 V (F2.8)
6	UNREG OUT	+10.6 V ~ +17 V
7	IRIS POSITION IN	+3.4 V (F16) ~ +6.2 V (F2.8)
8	REMOTE/LOCAL OUT	0 V
9	EXTENDER ON/OFF IN	ON: 0 V, OFF: +5 V or OPEN
10	(Spare)	
11	(Spare)	
12	(Spare)	

REMOTE (6P)



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	(Spare)	
2	SERIAL DATE IN/OUT	Serial data for camera control
3	UNREG (GND)	GND for UNREG
4	(Spare)	
5	(Spare)	
6	UNREG OUT	+10.6 V ~ +17 V

1-4-2. Connector

When cables with connectors are set to the respective connectors on the connector panel during installation or service, the specified or equivalent connectors with cables, or the specified cable assemblies should be used, these are listed as follows;

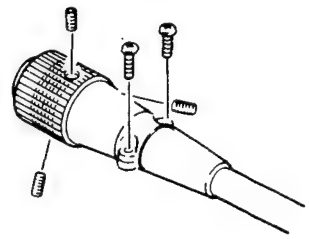
Connector function	Parts No., and name of connector with cable
TEST OUT (BNC)	1-560-069-11 PLUG, BNC or UGC-0.5 cable assembly (Cable length 1.5m, optional)
VF (20P, FEMALE)	1-558-609-11 PLUG, 20P, MALE
LENS (12P, FEMALE)	1-562-356-11 PLUG, 12P, MALE
REMOTE (6P, MALE)	1-557-406-11 REMOTE CONTROL CABLE (Cable length 10m)
50-PIN CONNECTOR (50P, MALE)	1-562-083-00 PLUG, 50P, FEMALE (Contained within CA-3A, CA-50 and BVV-5)

1-4-3. Removal of the CCZ, CCZQ connectors

CCZ, CCZQ Connectors (Removal of the connector)

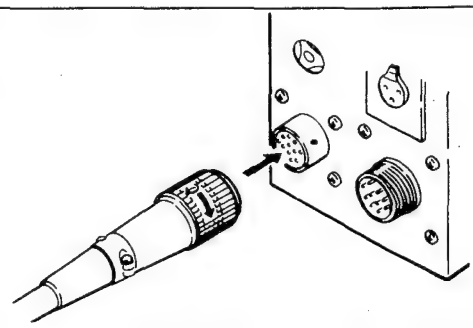
Step 1.

Remove the three hexagonal setscrews and the two setscrews.



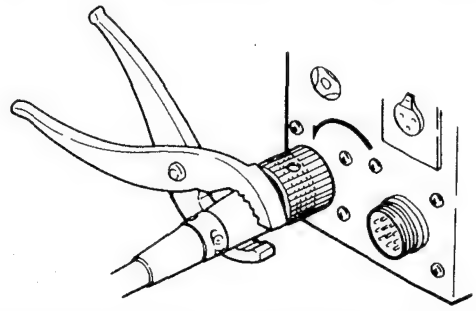
Step 2.

Fix the CCZ connector at the camera or VTR connector.



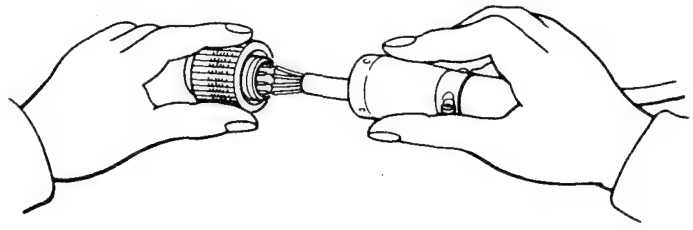
Step 3.

Rotate the CCZ connector counterclockwise by the plier and loosen it.



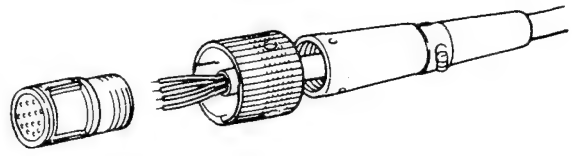
Step 4.

It can be removed by hand and unsolder.

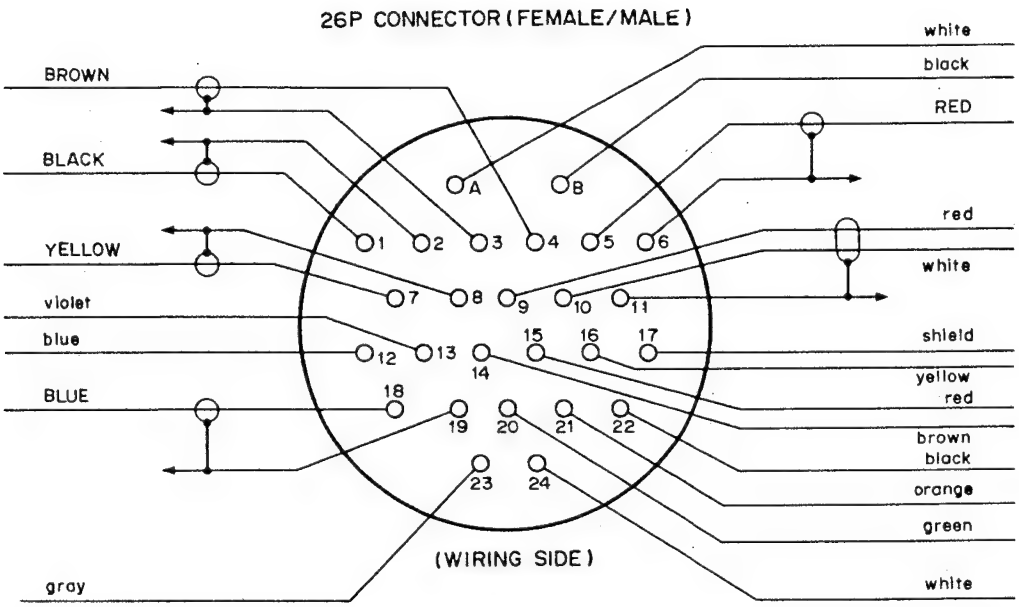


Step 5.

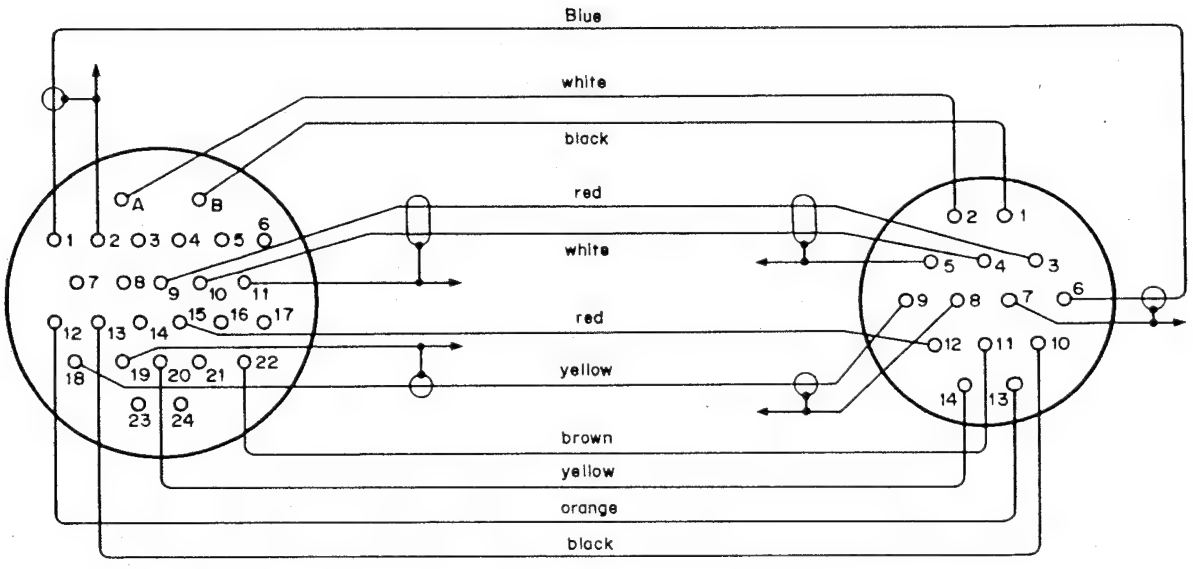
It can be broken up as shown in Figure.



CCZ cable (wiring diagram)



CCZQ cable (wiring diagram)



26P CONNECTOR (FEMALE)
(WIRING SIDE)

14P CONNECTOR (MALE)
(WIRING SIDE)

1-5. INSTALLATION CONDITIONS

Operating temperature	0°C to +45°C
Storage temperature	-20°C to +60°C
Humidity	Non condense

- Avoid rough handling or mechanical shock to the camera.
- Avoid placing subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Clean the viewfinder lens with a lens cleaner available at camera stores.
  Do not use any type of solvent, such as alcohol, benzine or thinner.

- After using the camera
  Turn off the power of a equipment connected to the camera.

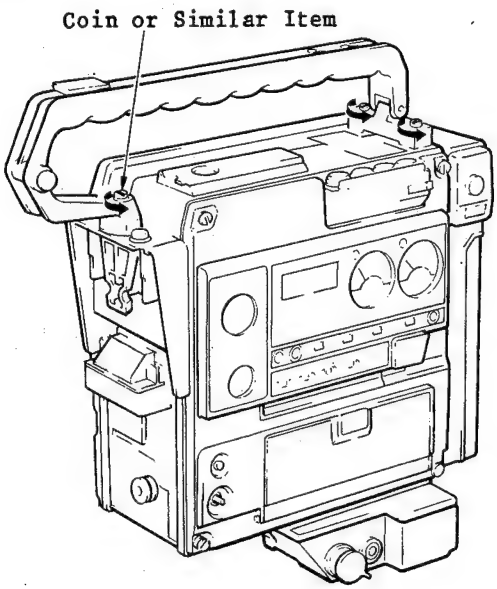
1-6. SET-UP

1-6-1. Set up with the BVV-1/1PS/1A/1APS/5/5PS VTR

(1) When the grip of BVP-70/70P is used;

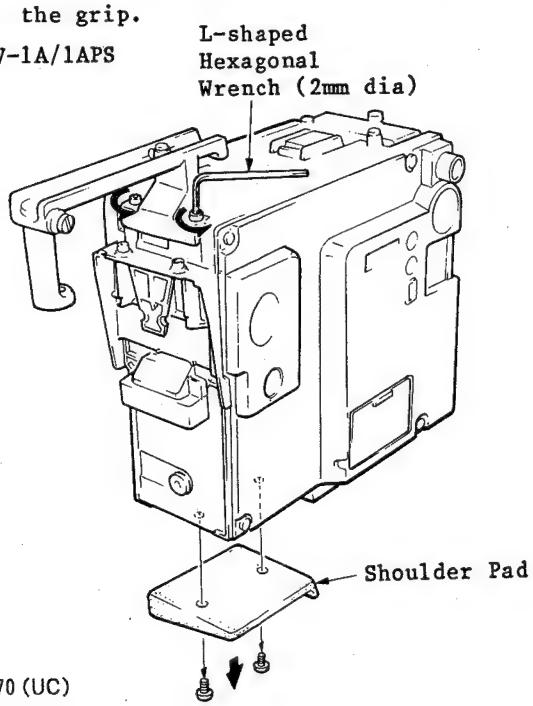
Step 1. Remove the grip and shoulder pad of the VTR.

BVV-5/5PS

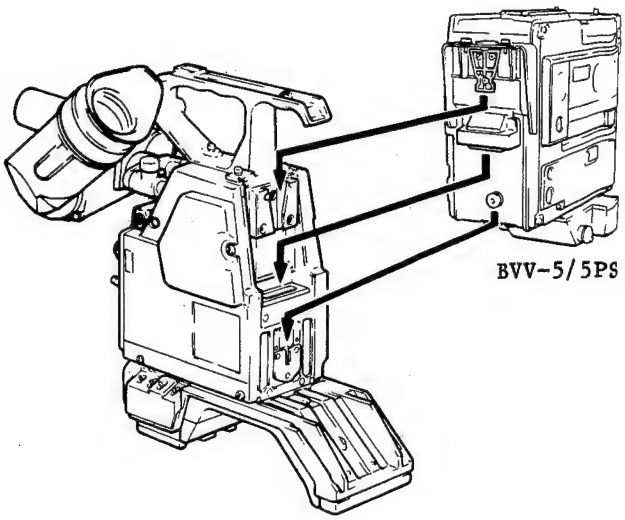


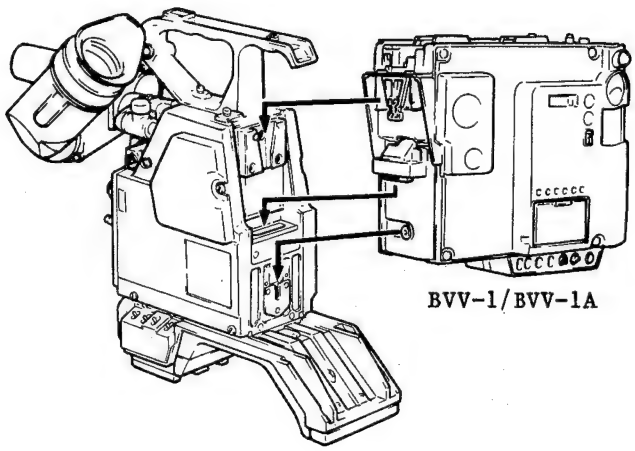
Note; After removing the grip, attach the cover (supplied) to the screw holes of the grip.

BVV-1A/1APS



Step 2. Attach the VTR to the camera.



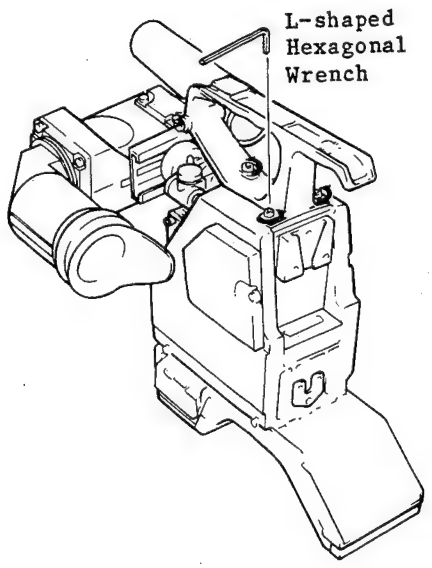


Step 3. Tighten the screws (supplied with the VTR) securely.

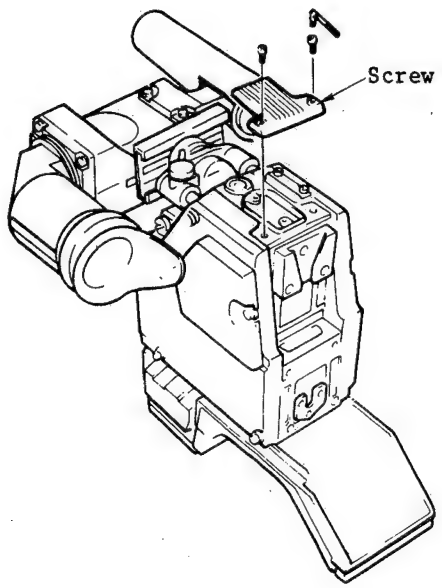
Step 4. Insert the 2 screws (M4) supplied with the VTR into the unoccupied screw holes for the VTR grip.

(2) When the grip of BVV-1/1PS/1A/1APS/5/5PS VTR is used;

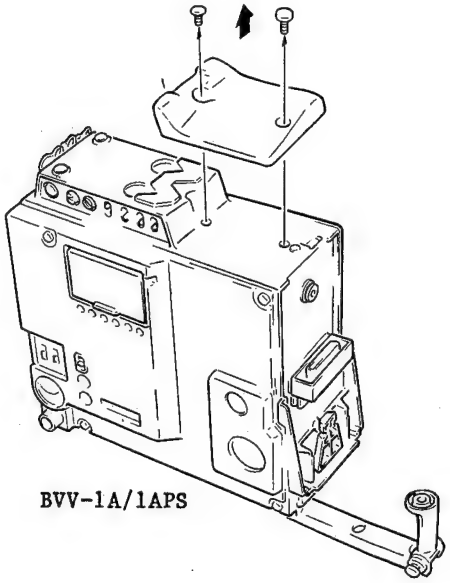
Step 1. Remove the grip of the camera.



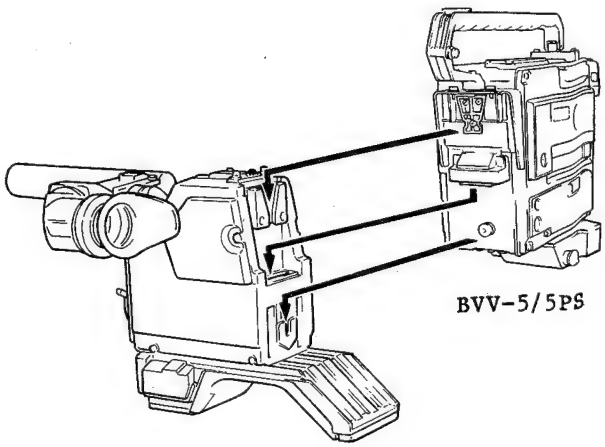
Step 2. Attach the cover (sulpplied) to the screw holes of the grip.

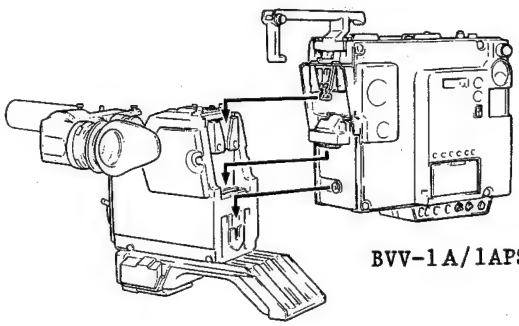


Step 3. Remove the shoulder pad of the VTR.



Step 4. Attach the VTR to the camera.

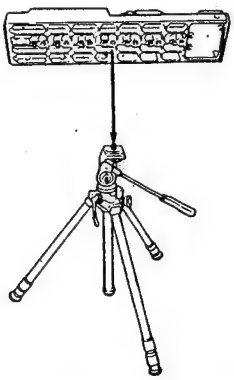




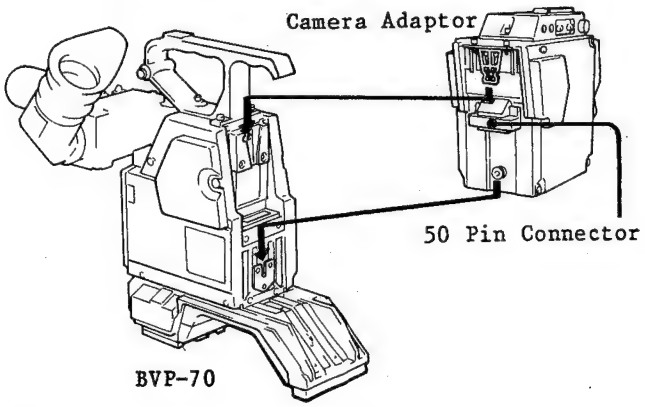
Step 5. Fasten the screws (supplied with the VTR) securely.

1-6-2. For System Use

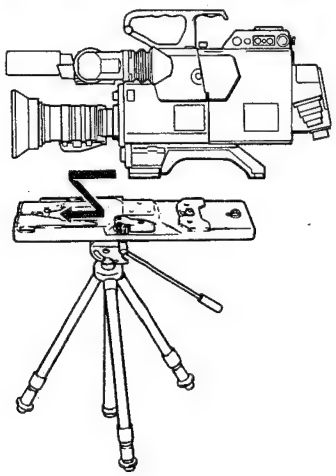
Step 1. Attach the tripod attachment (VCT-14) to the tripod.
Fit the screw of the tripod into one of the screw holes on the bottom of the tripod attachment.



Step 2. Attach the camera adaptor to the camera. Fasten the 2 screws securely.



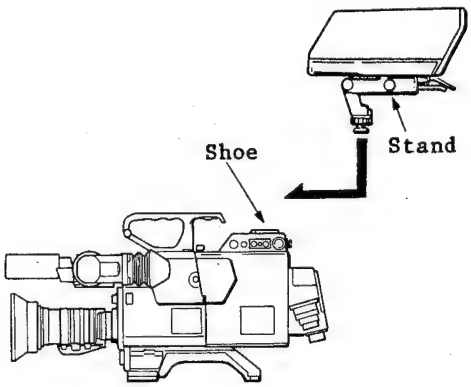
Step 3. Attach the camera to the tripod attachment.
Slide the camera along the groove of the tripod attachment until it clicks.



Step 4. Attach the viewfinder (BVF-50) to the shoe on the camera adaptor. (Refer to BVF-50 operation and maintenance manual.)

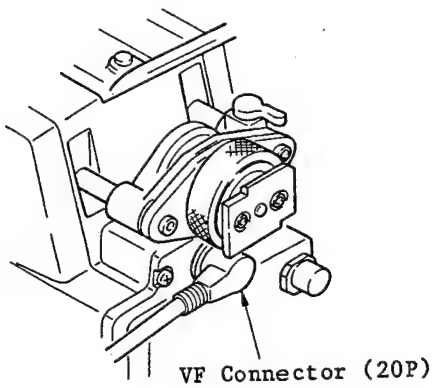
(1) Attach the viewfinder stand (supplied with BVF-50) to the viewfinder.

(2) Attach the viewfinder stand to the shoe on the camera adaptor.
Slide the bottom plate of the stand to the shoe on the camera adaptor, and tighten the ring of the stand.
If you can not install the viewfinder because of the grip of camera, remove the grip.



(3) Remove the 1.5inch viewfinder (supplied with BVP-70/70P).

(4) Connect the BVF-50 to the VF connector on the camera with the 20P-12P connecting cable (supplied with the BVF-50).



1-7. GAIN CHANGES

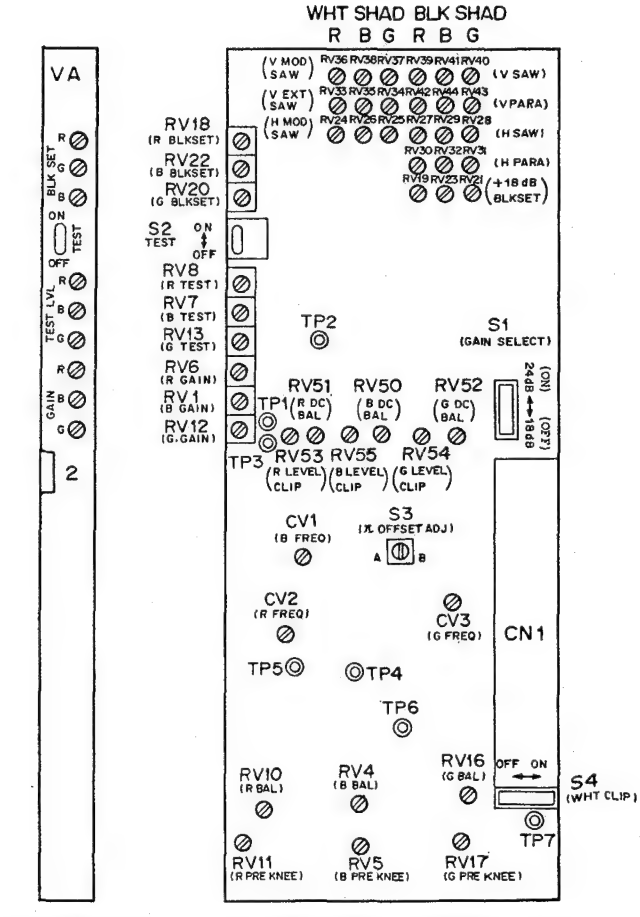
The gains of 0-9-18dB can be selected with the GAIN selector (side panel) at the factory. Therefore the gain can be set as follows.

0 - 9 - 18dB

0 - 9 - 24dB

Changing from 18dB to 24dB

By setting the S1 (GAIN SELECT) switch on the VA-85 board to "24dB", the video output level can be raised by 24dB at the 18-position of GAIN selector (side panel). When the S1 switch is changed; 18dB → 24dB or 24dB → 18dB, be sure to perform the +18 dB Black Set adjustment.



VA-85 BOARD (PANEL SIDE)

VA-85 BOARD (COMPONENT SIDE)

1-8. SWITCH, CONTROL SETTING

1-8-1. Daily Maintenance

VA-85

BLK SET (R, G, B) (RV18, 20, 22)
Adjust so that no pedestal level changes when the GAIN switch is set at +9dB or +18dB.

TEST ON/OFF (S2)
Used for checking the video level.
When turned on, the lens is automatically closed and the TEST SAW waveform is added to the video signal system. Normally set to "OFF".

TEST LVL R, G, B (RV7, 8, 13)
Used for checking the video level.
Adjust the level of TEST SAW waveform signal at 100IRE (700mV).

GAIN R, G, B (RV1, 6, 12)
Adjust their controls so that the video level of output at VA-85 board is 0.5Vp-p.

IE-25/25P

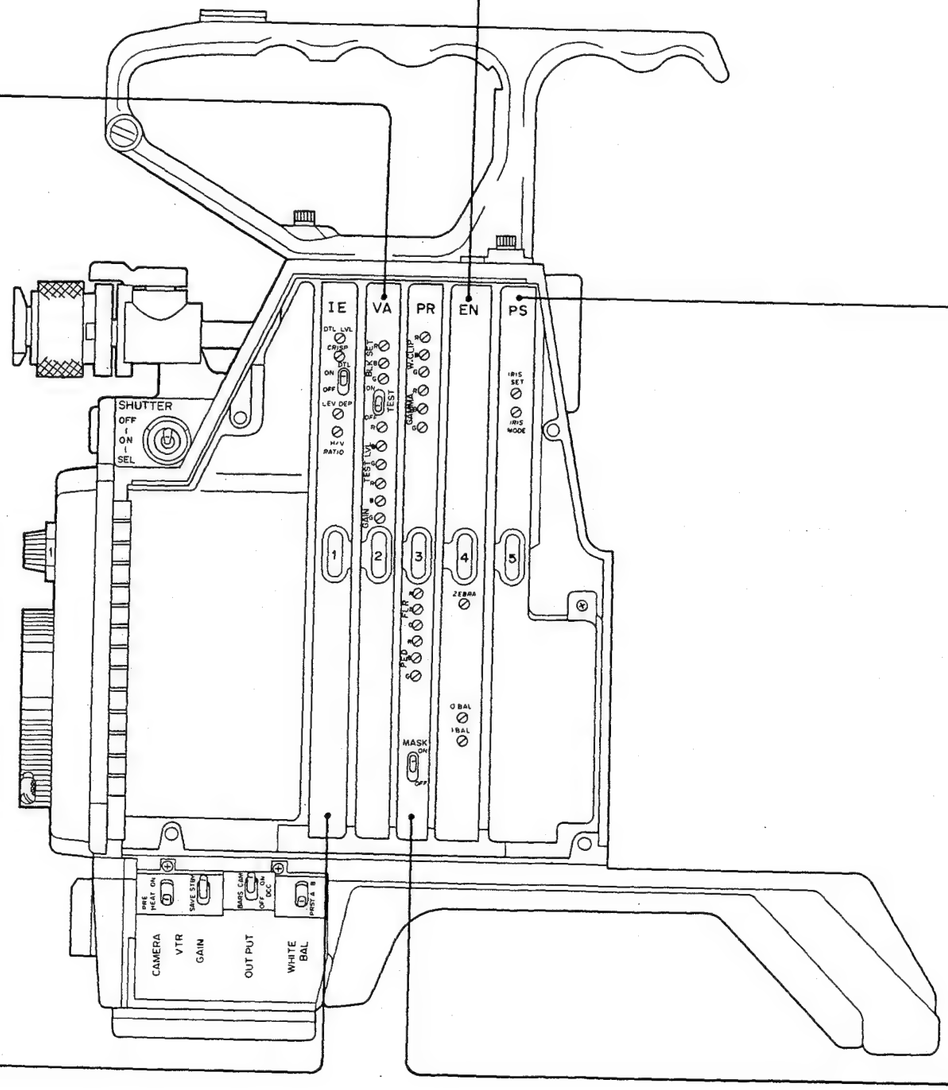
DTL ON/OFF (S1)
Turn on or off the detail signal.

DTL (RV5)
Adjust the detail amount.

H/V RATIO (RV7)
Adjust the balance of the horizontal and vertical of the detail signals.

LEVEL DEPEND (RV8)
Set this control so that the detail signal is not superimposed near the black level of a signal.

CRISPENING (RV4)
Set this control so that the small amplitude noise is eliminated from the detail signal.



EN-69/69P

ZEBRA (RV13)
Adjust RV13 so that the 70IRE (500mV) section is displayed on the viewfinder screen in a zebra pattern.

Q/U BAL (RV21)

I/V BAL (RV19)
Adjust two controls alternatively and observe the output video signal (composite video signal) corresponding to the black portion. The adjustment should be minimized the carrier leakage.

PS-224

IRIS SET (RV5)
IRIS MODE (RV4)
Adjust the detection method of the video level and the sensitivity for the signal when the lens iris is set to "Auto" mode. The peak level detection is selected when the IRIS MODE is at the fully counterclockwise position and the average level detection is selected at its fully clockwise position. Set the IRIS MODE to the mid position, shoot the gray scale chart and adjust the IRIS SET so that the white peak level is 100IRE (700mV).

PR-138A/138B

GAMMA R, G, B (RV3, 8, 12)
When a 11-step grayscale chart is shot so that the white level is 100IRE (700mV), set the cross point of the waveform at 60IRE (420mV).

W. CLIP R, G, B (RV22, 23, 24)
When setting the GAIN switch at +18dB, adjust the white level.

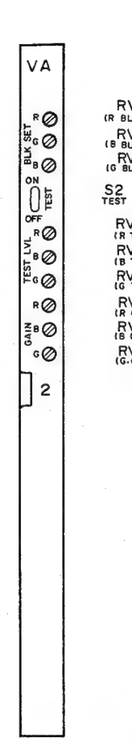
PED R, G, B (RV2, 33, 10)
Close the lens iris, and set the pedestal level at 3IRE.

FLR R, G, B (RV25, 26, 27)
Compensate the dispersion of the video level due to the flare.

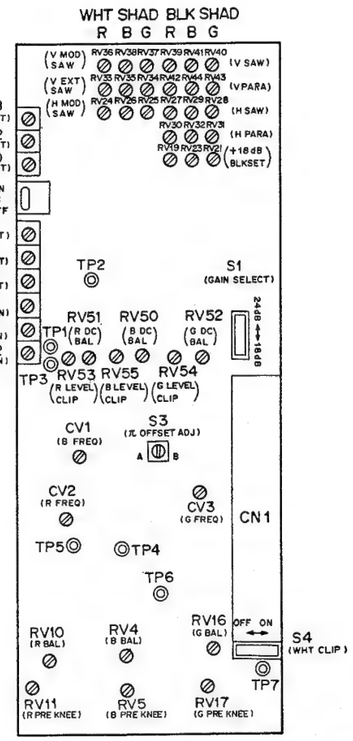
MASK ON/OFF (S1)
Change over the masking signal to ON or OFF. Normally set to OFF. (PAL: ON)

LEVEL CHECK SHEET

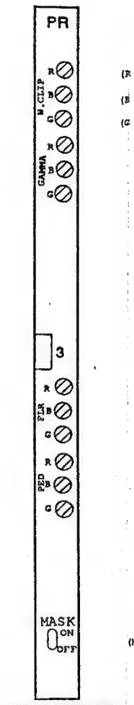
1. Adjust the iris control so that the video level at CN1-34/VA-85 board is 0.25V± 0.03V for BVP-70/70P and 0.275V±0.03V for BVP-70IS/70ISP.
2. Adjust the ⊘RV12 (G GAIN)/VA-85 board so that the video level at CN1-32/PR-138A, 138B board is 0.5+0.01Vp-p.
3. Adjust the ⊘RV6 (R GAIN)/VA-85 board so that the video level at CN1-7/PR-138A, 138B board is 0.5±0.01Vp-p.
4. Adjust the ⊘RV1 (B GAIN)/VA-85 board so that the video level at CN1-5/PR-138A, 138B board is 0.5±0.01Vp-p.
5. Set the S2 (TEST ON/OFF)/VA-85 to "ON".
6. Adjust the ⊘RV13 (G TEST)/VA-85 board so that the video level at CN1-32/PR-138A, 138B board is 0.5±0.01Vp-p.
7. Adjust the ⊘RV8 (R TEST)/VA-85 board so that the video level at CN1-7/PR-138A, 138B board is 0.5±0.01Vp-p.
8. Adjust the ⊘RV7 (B TEST)/VA-85 board so that the video level at CN1-5/PR-138A, 138B board is 0.5±0.01Vp-p.
9. Adjust the ⊘RV7 (G γ BIAS)/PR-138A, 138B board for such a position that the white peak level at CN1-17/PR-138A, 138B board does not change while setting S3 (γ ON/OFF)/PR-138A, 138B board at ON or OFF.
10. Adjust the ⊘RV2 (R γ BIAS)/PR-138A, 138B board for such a position that the white peak level at CN1-18/PR-138A, 138B board does not change while setting S3 (γ ON/OFF)/PR-138A, 138B board at ON or OFF.
11. Adjust the ⊘RV11 (B γ BIAS)/PR-138A, 138B board for such a position that the white peak level at CN1-16/PR-138A, 138B board does not change while setting S3 (γ ON/OFF) /PR-138A, 138B board at ON or OFF.
12. Adjust the ⊘RV9 (G GAIN)/PR-138A, 138B board so that the video level at TP2/EN-69, 69P board is 0.7±0.01Vp-p.
13. Adjust the ⊘RV4 (R GAIN)/PR-138A, 138B board so that the video level at TP1/EN-69, 69P board is 0.7±0.01Vp-p.
14. Adjust the ⊘RV13 (B GAIN)/PR-138A, 138B board so that the video level at TP3/EN-69, 69P board is 0.7±0.01Vp-p.



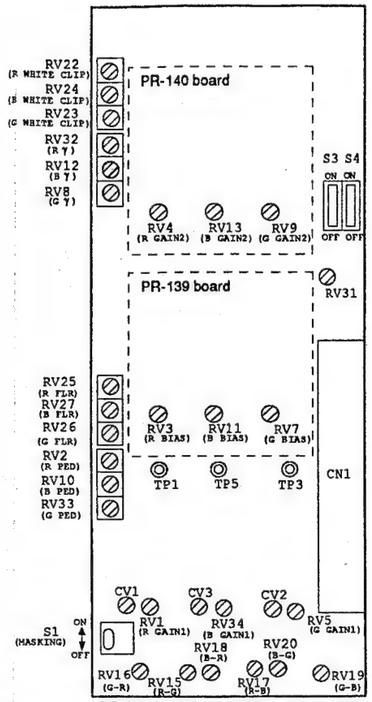
VA-85 BOARD (PANEL SIDE)



VA-85 BOARD (COMPONENT SIDE)

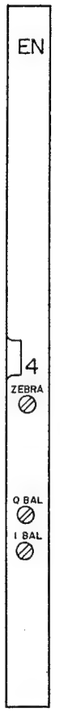


PR-138A/138B BOARD (PANEL SIDE)

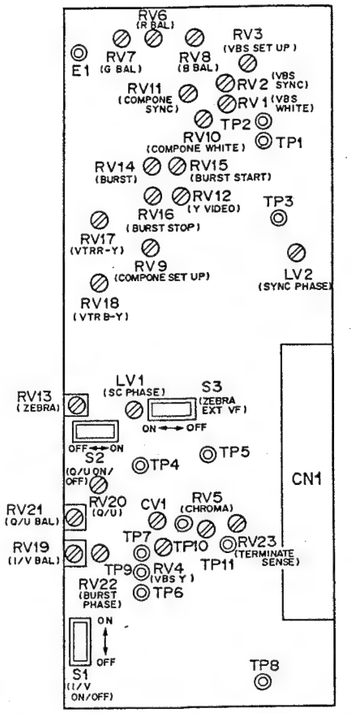


PR-138A/138B BOARD (COMPONENT SIDE)

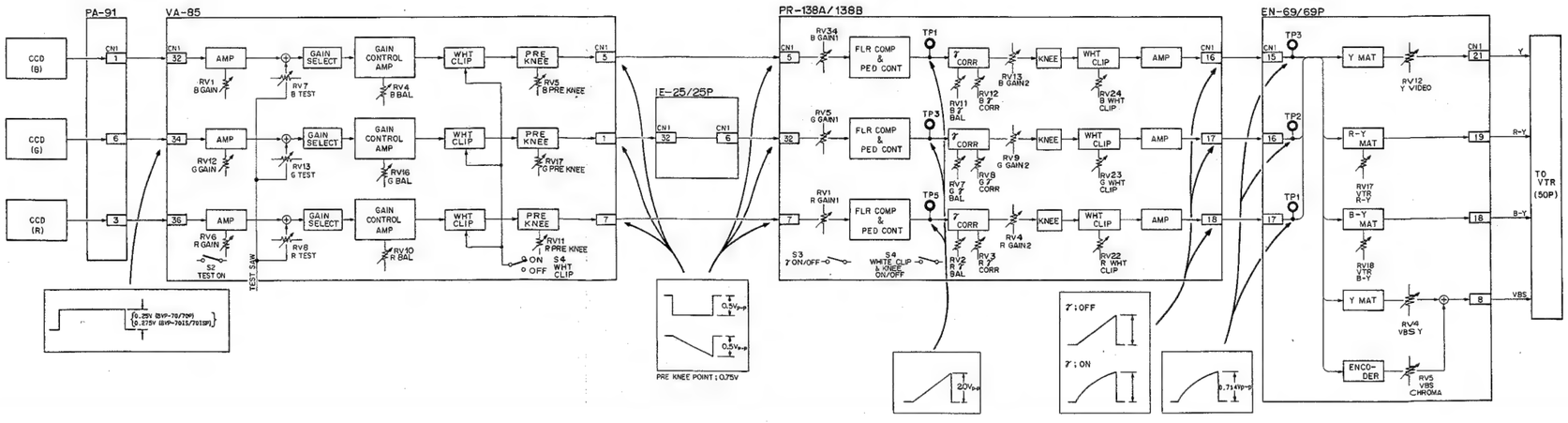
EN-69P BOARD (PANEL SIDE)



EN-69 BOARD (PANEL SIDE)



EN-69/69P BOARD (COMPONENT SIDE)



1-8-2. Switches Setting on the Board

[VA-85 board]

. S1 (GAIN SELECT)

By setting the GAIN selector (side panel) to "18", the video output level can be raised by 18dB or 24dB with this switch.

In this case, be sure to perform the +18dB Black Set Adjustment for R, G and B video signals respectively.

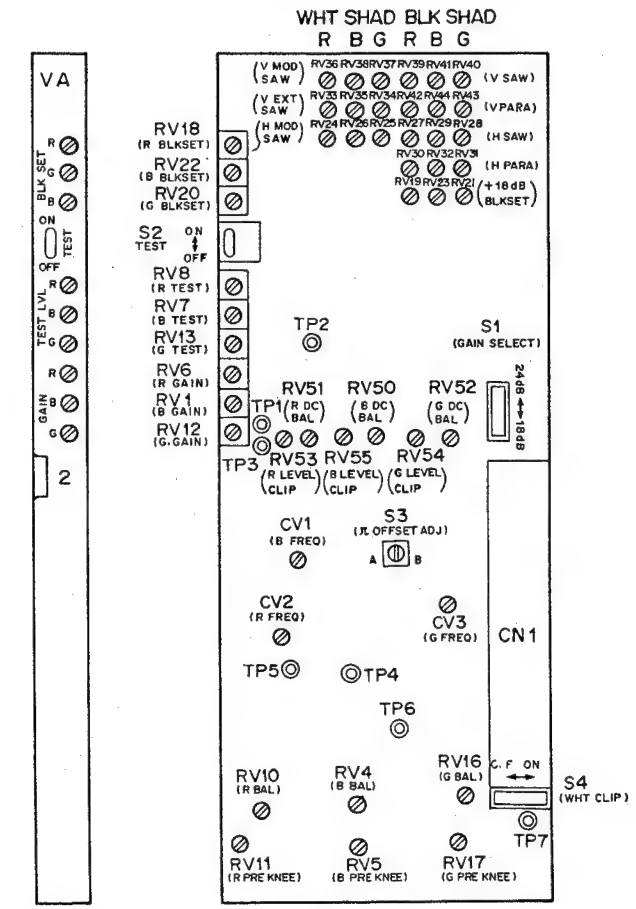
[PR-138A/138B board]

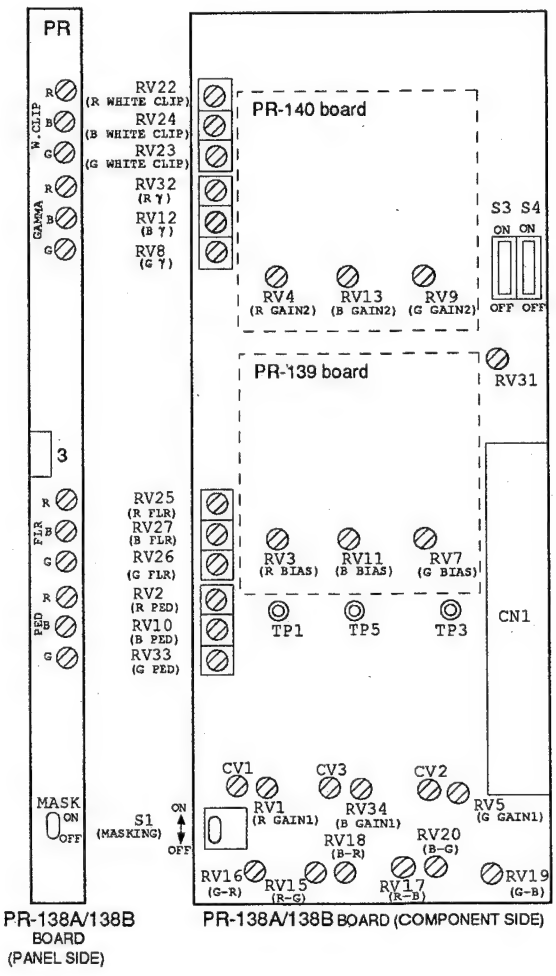
. S3 (γ ON/OFF)

When turned on, the gamma correction is performed so that the overall characteristic of signals between camera and monitor is " $\gamma = 1$". Normally set to "ON".

. S4 (WHITE CLIP & KNEE)

When turned off, the white clipping and knee correction are automatically released. Use for the video signal system adjustment. Normally set to "ON".





[EN-69/69P board]

. S1 (1/V) S2 (Q/U)

When turned on, the I (Q) signal is added to the encoder circuit. Use for the encoder circuit adjustment. Normally set to "ON".

. S3 (ZEBRA EXT VF)

When viewfinder BVF-50 is used, 70% level portion is displayed in the zebra pattern on the viewfinder screen with this switch set to "ON". Normally set to "OFF".

[PS-224 board]

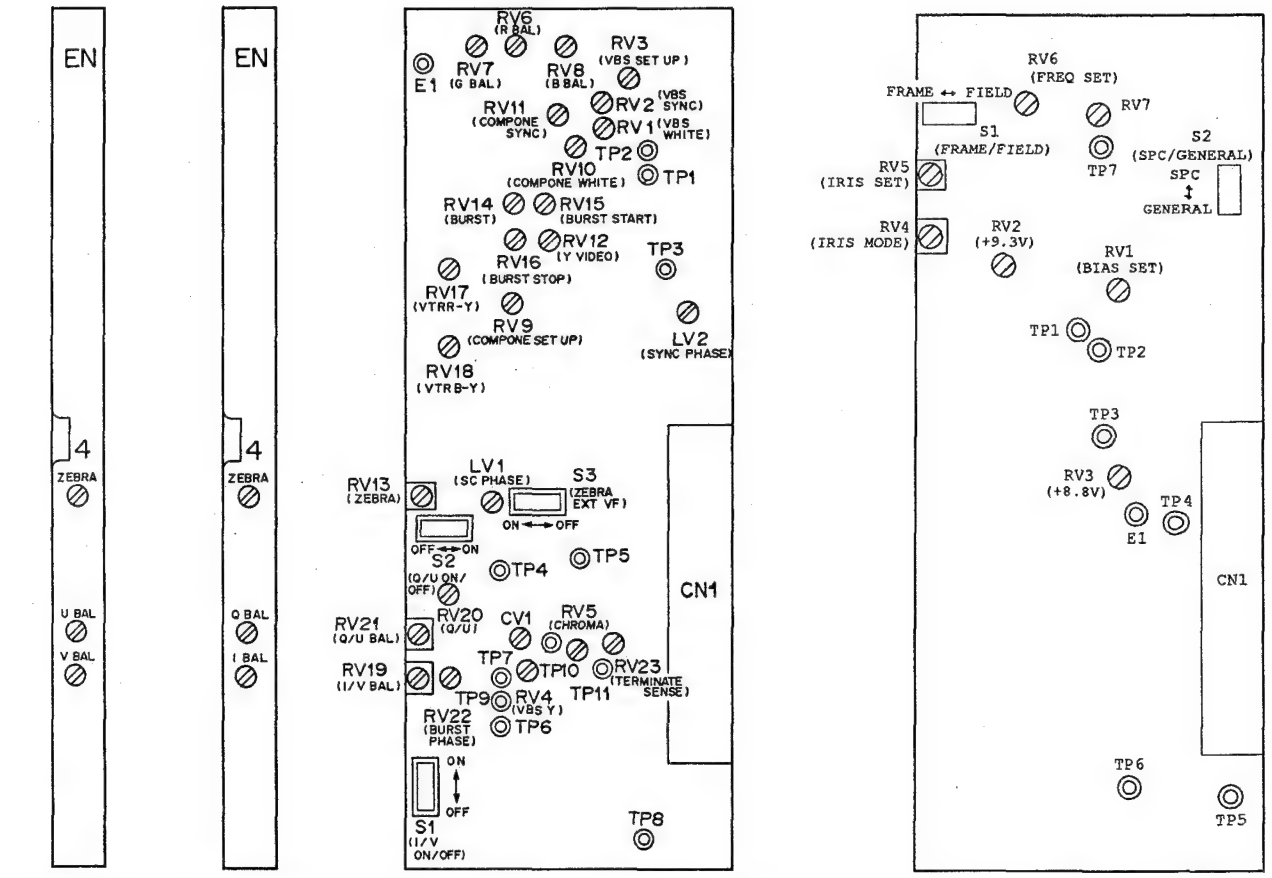
. S1 (FIELD/FRAME)

Selects the ways of CCD picture readout; "FIELD" or "FRAME". It has been set to "FIELD" at the factory.

. S2 (SPC/GENERAL)

Selects the modes of the REC lamp in the Viewfinder and TALLY lamp.

They operate ordinarily with the S2 switch set to "GENERAL". When set to "SPC", they operate as the W/B lamp besides their ordinary functions.



EN-69P BOARD (PANEL SIDE) EN-69 BOARD (PANEL SIDE) EN-69/69P BOARD (COMPONENT SIDE) PS-224 BOARD (COMPONENT SIDE)

[SG-143/143AP board]

. S1 (H BLKG SELECT)
Adjusts the horizontal blanking width. It has been adjusted so as to be 10.9±2uS.

. S2 (V BLKG SELECT)...NTSC only
Adjusts the vertical blanking width. It has been set to "20H".

. S4 (COLOR FRAME)
When turned on, the color framing pulse is fed from pin 37 of 50-pin connectors.

. S5 (CABLE COMP)
In the external synchronous mode, turns off the GENLOCK signal from a connection cable under 150m and turns on the signal for one exceeding 150m.

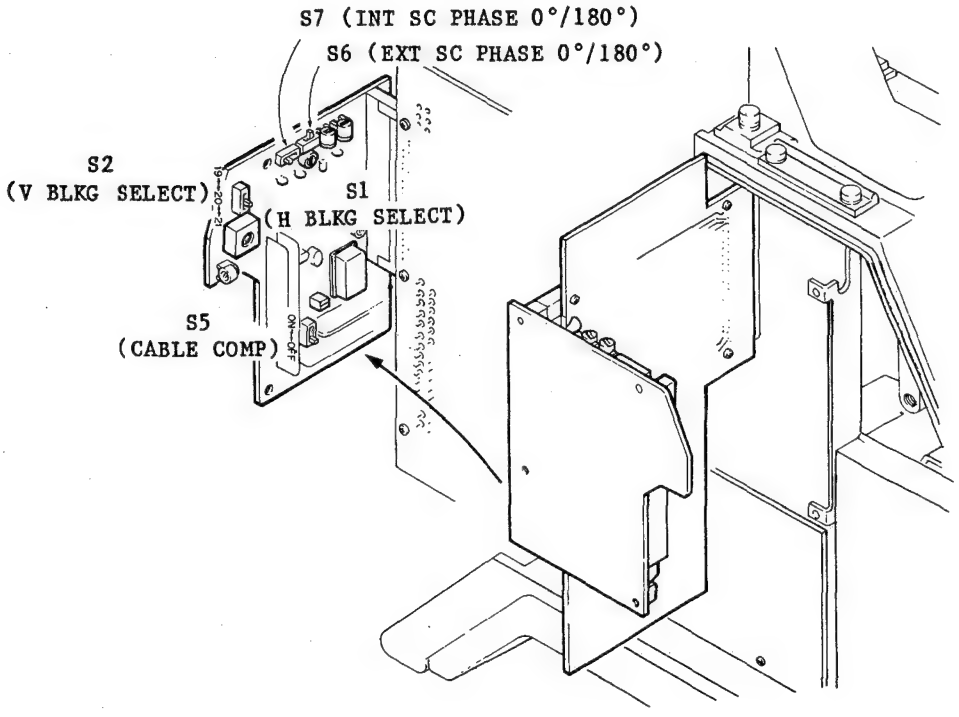
. S6 (EXT SC PHASE 0°/180°)

. RV4 (EXT SC PHASE)
Adjusts the SC (subcarrier) phase of the output signal in the external synchronous mode.

. S7 (INT SC PHASE 0°/180°)

. RV5 (INT SC PHASE)
Adjusts the SC (subscatter) phase of the output signal in the internal synchronous mode.
(Be sure not to turn RV5 except when adjustment is out of condition.)

. RV3 (H PHASE)
Adjusts the phase of the camera video signal in the external synchronous mode.



[AT-58]

. S1 (CHECK, FP INH)

CHECK

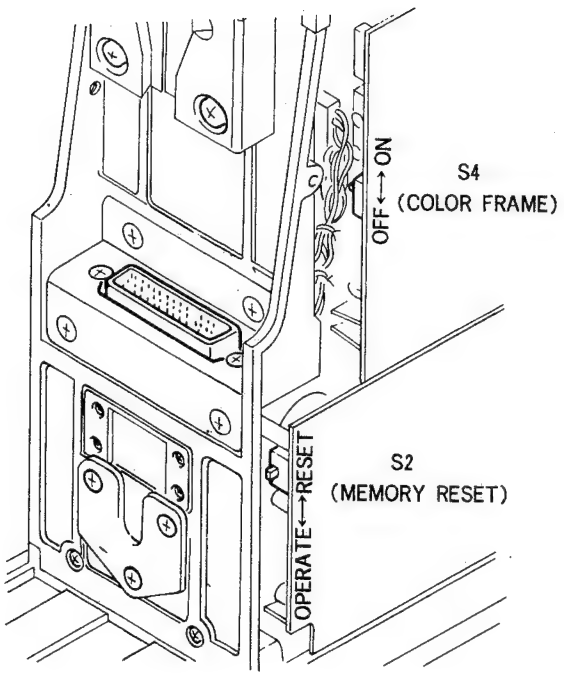
This switch is not used. Normally set to "ON".

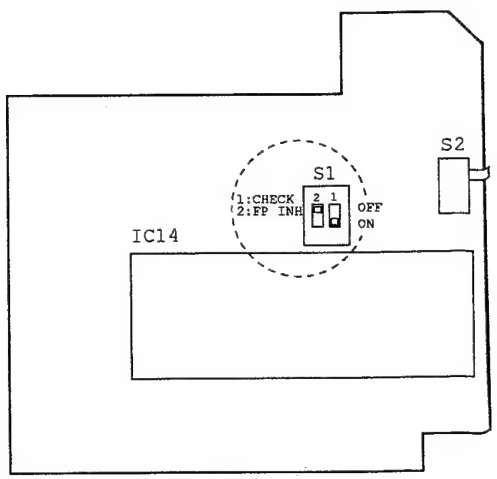
FP INH

When set to "OFF (OPEN)", the values of the white balance adjusted at each filter position can be stored in the memory A and B independently. In short, up to 8 adjusted values; 4 for the memory A and 4 for the memory B can be stored. When set to "ON", only 2 adjusted values; one for A and 4 for B can be stored. In this case, the adjusted values will not correspond to the selection of the color temperature conversion filter. According to the selection of WHITE BAL switch (side panel), the white balance value is stored in the memory A and B or read out.

. S2 (MEMORY RESET)

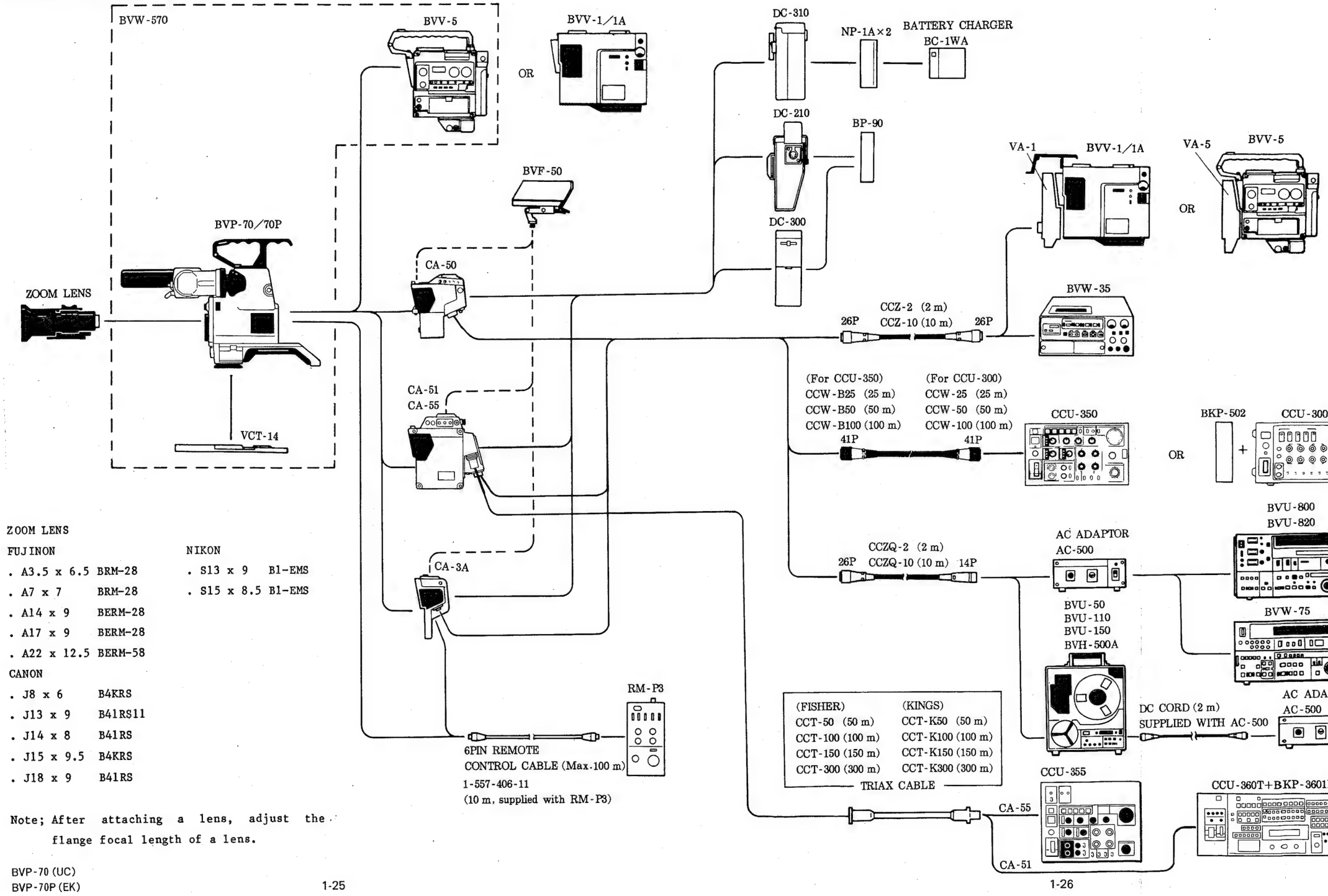
By setting the CAMERA/VTR switch (side panel) to "OFF" and this switch to "RESET", the compensation data stored in the microcomputer can be reset. Normally set to "OPERATE".





AT-58 BOARD (COMPONENT SIDE)

1-9. SYSTEM CONFIGURATION



ZOOM LENS

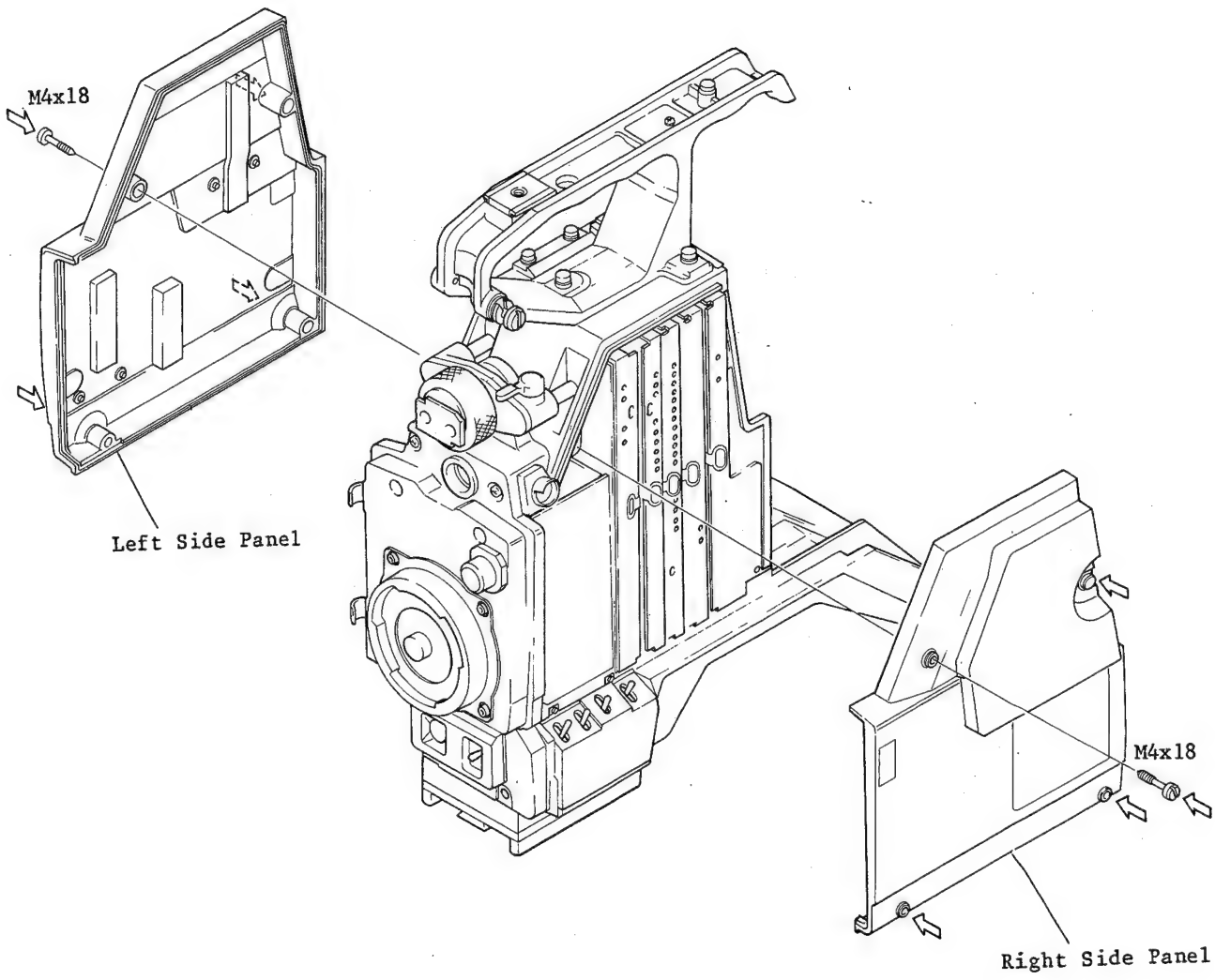
FUJINON		NIKON	
. A3.5 x 6.5	BRM-28	. S13 x 9	B1-EMS
. A7 x 7	BRM-28	. S15 x 8.5	B1-EMS
. A14 x 9	BERM-28		
. A17 x 9	BERM-28		
. A22 x 12.5	BERM-58		
CANON			
. J8 x 6	B4KRS		
. J13 x 9	B41RS11		
. J14 x 8	B41RS		
. J15 x 9.5	B4KRS		
. J18 x 9	B41RS		

Note; After attaching a lens, adjust the flange focal length of a lens.

SECTION 2
REPLACEMENT OF MAIN PARTS

2-1. CABINET REMOVAL

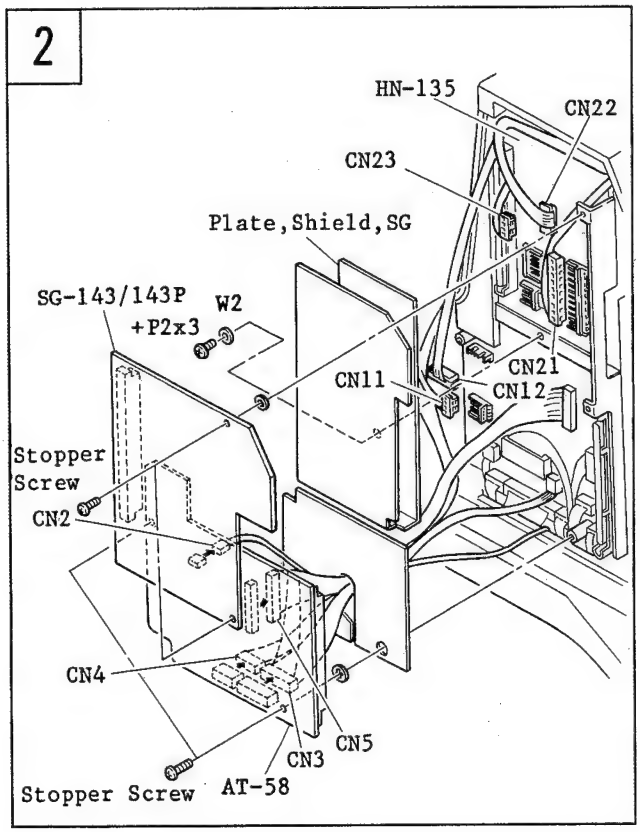
To remove the left or right side panel, unscrew the four screws (M4x18) respectively.



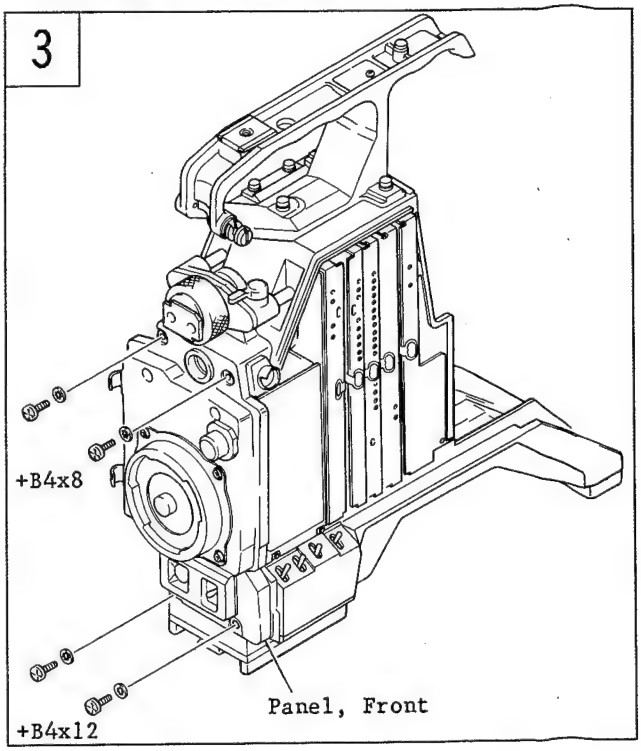
2-2. REPLACEMENT OF CCD UNIT

1. Remove the left and right side panels, referring to Section 2-1 "CABINET REMOVAL".

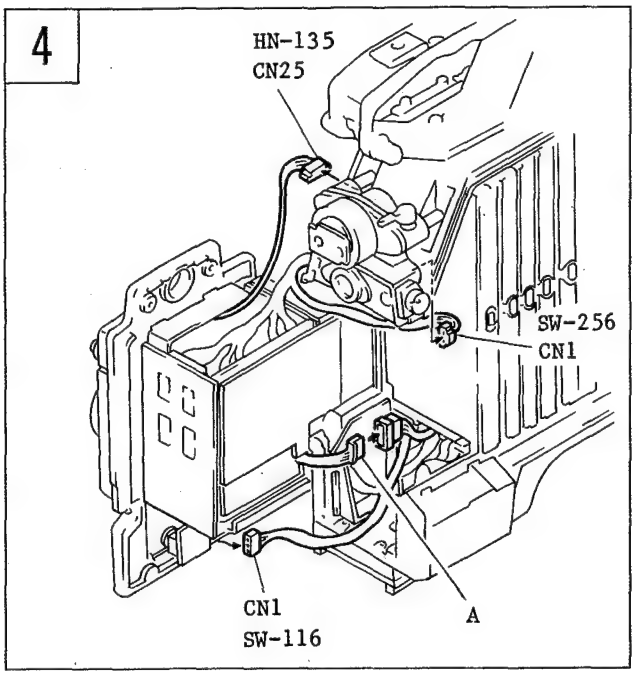
2. Remove the four stopper screws and remove the SG-143/143AP board and AT-58 board. Disconnect the four connectors, CN2, CN3, CN4, and CN5 on the AT-58 board.
   Remove the one screw (+P2x3) and remove the SG SHIELD PLATE. Disconnect the five connectors, CN11, CN12, CN21, CN22 and CN23 on the HN-135 board.



3. Remove the four screws (+B4x8, +B4x12) securing the front panel to the camera.



4. Disconnect the three connectors, CN25 on the HN-135 board, CN1 on the SW-116 board and CN1 on the SW-256 board. Disconnect the connector A shown in the figure.

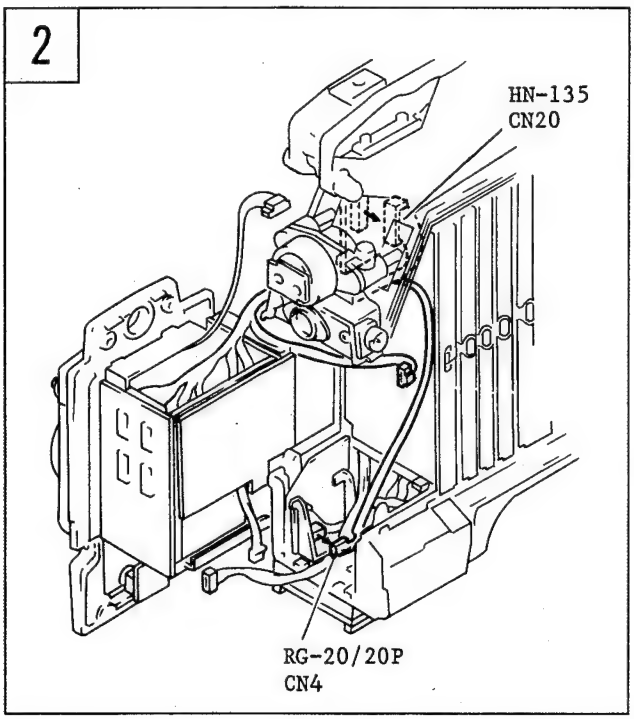


5. When a new CCD unit is installed, reverse the procedures for removal.

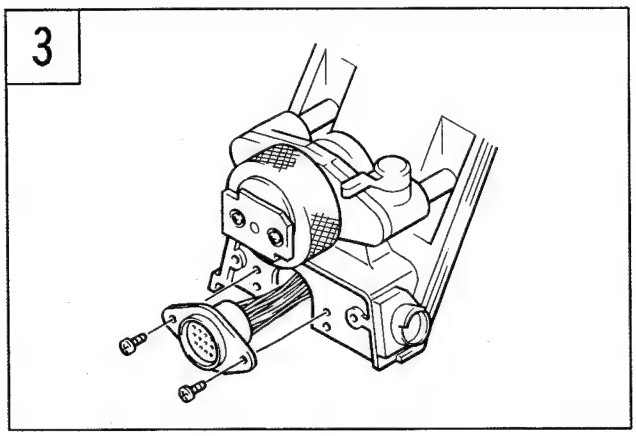
2-3. REPLACEMENT OF CONNECTORS

2-3-1. Replacement of VF Connector

1. Carry out Steps 1 to 4 in Section 2-2 "REPLACEMENT OF CCD UNIT".
2. Disconnect the two connectors, CN20 on the HN-135 board and CN4 on the RG-20/20P board.



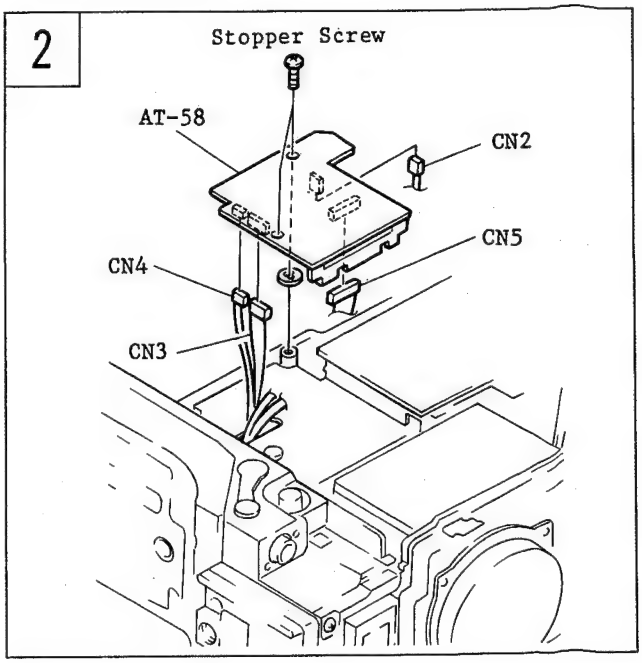
3. Remove the two screws securing the VF connector to the camera and pull out the VF connector with harness connected.



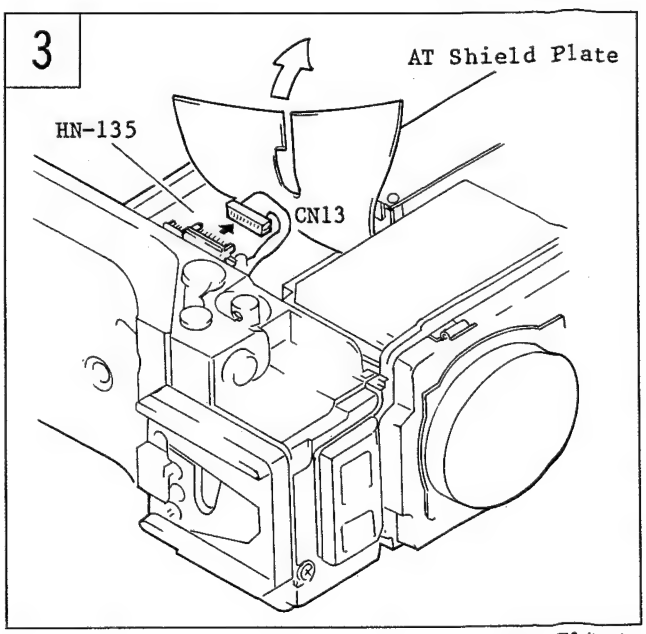
4. When installing a new VF connector, reverse the procedures for removal.

2-3-2. Replacement of LENS Connector

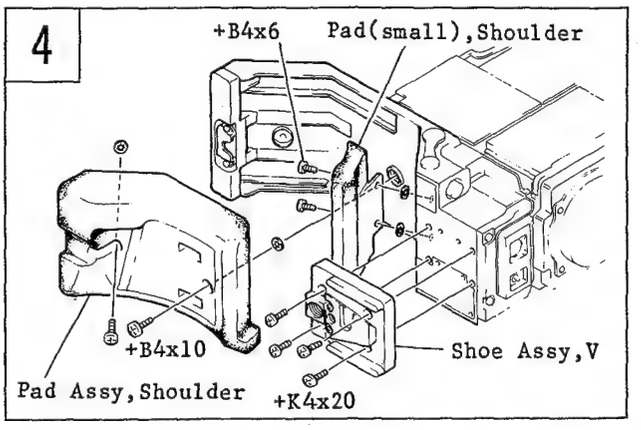
1. Remove the left side panel, referring to Section 2-1 "CABINET REMOVAL".
2. Remove the two stopper screws and remove the AT-58 board. Disconnect the four connectors, CN2, CN3, CN4 and CN5 on the AT-58 board.



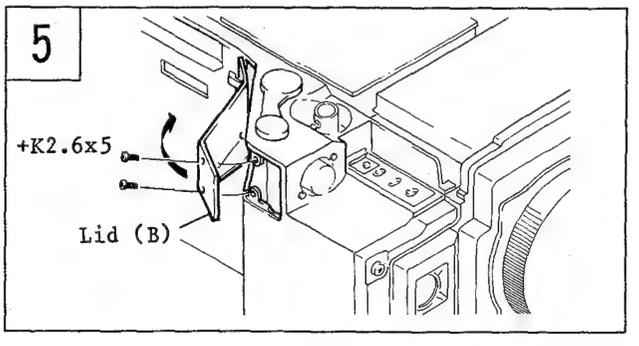
3. Lift up the AT SHIELD PLATE and disconnect the connector CN13 on the HN-135 board.



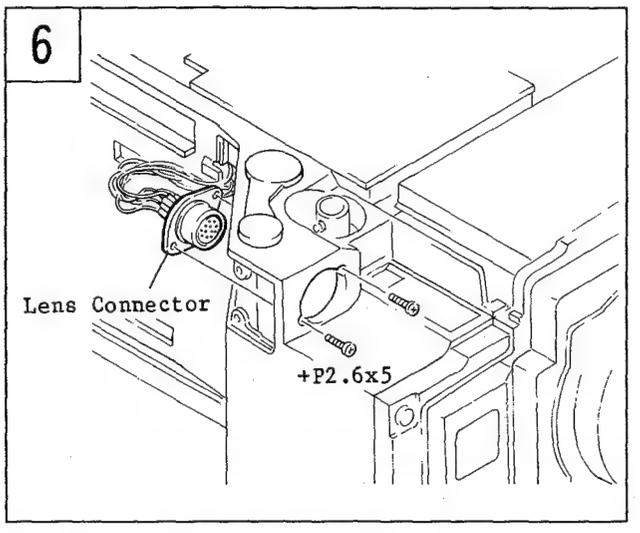
4. Lay the BVP-70/70P as illustrated. Remove the two screws (+B4x6) securing the SMALL SHOULDER PAD and remove the two screws (+B4x10) securing the SHOULDER PAD ASSY. Remove the four screws (+K4x20) securing the V SHOE ASSY.



5. Remove the two screws (+K2.6x5) and remove the lid (B).

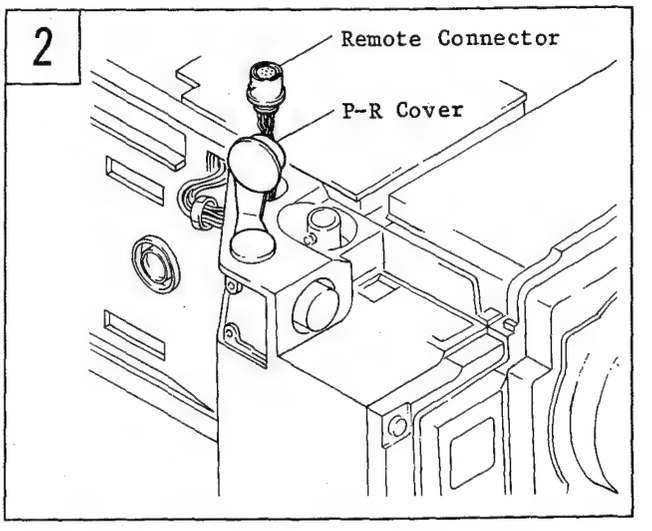


6. Remove the two screws (+P2.6x5) and remove the LENS connector with harness connected.

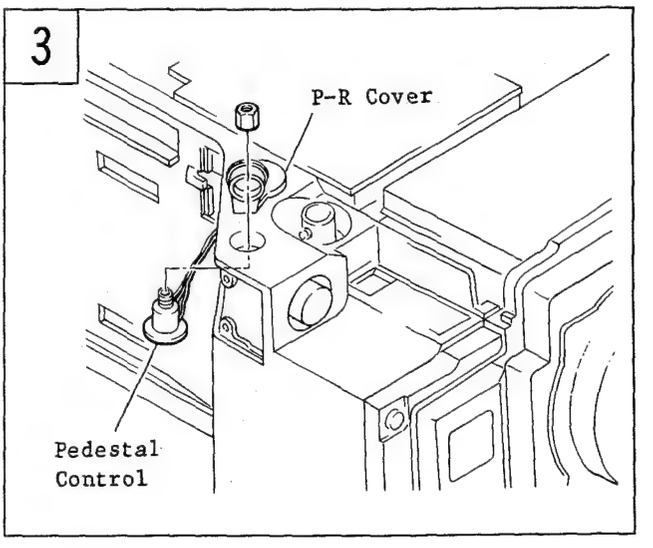


2-3-3. Replacements of REMOTE Connector and PEDESTAL Control

1. Carry out Steps 1 to 5 in Section 2-3-2 "Replacement of LENS Connector".
2. Uncover the P-R cover and remove the REMOTE connector as illustrated.



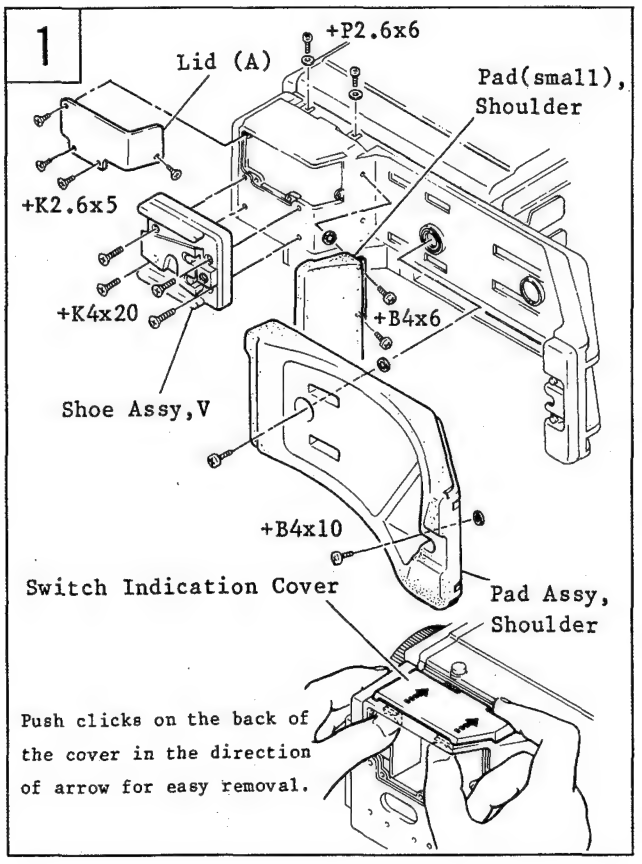
3. Uncover the P-R cover and remove the PEDESTAL control and nut as illustrated.



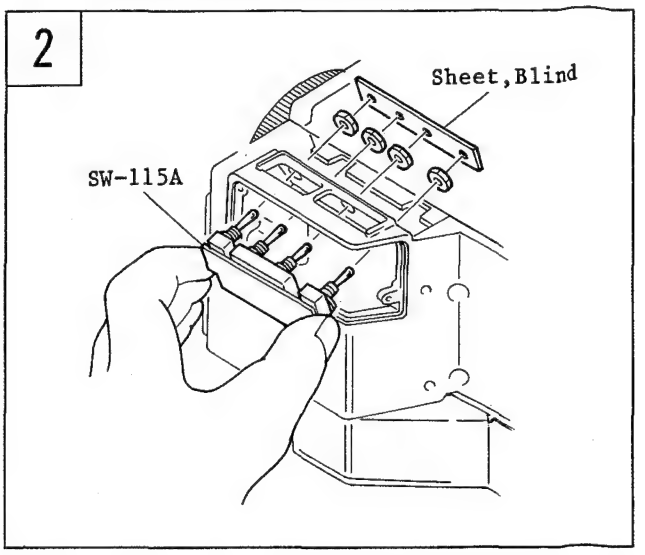
2-4. REPLACEMENT OF FUNCTION SWITCHES

2-4-1. Replacement of Switches on SW-115A Board

1. Lay the BVP-70/70P as illustrated. Remove the SHOULDER PAD ASSY, SMALL SHOULDER PAD and V SHOE ASSY. Remove the two screws (+K2.6x5) and remove the lid (A). Remove the two screws (+P2.6x6) and remove the switch indication cover.



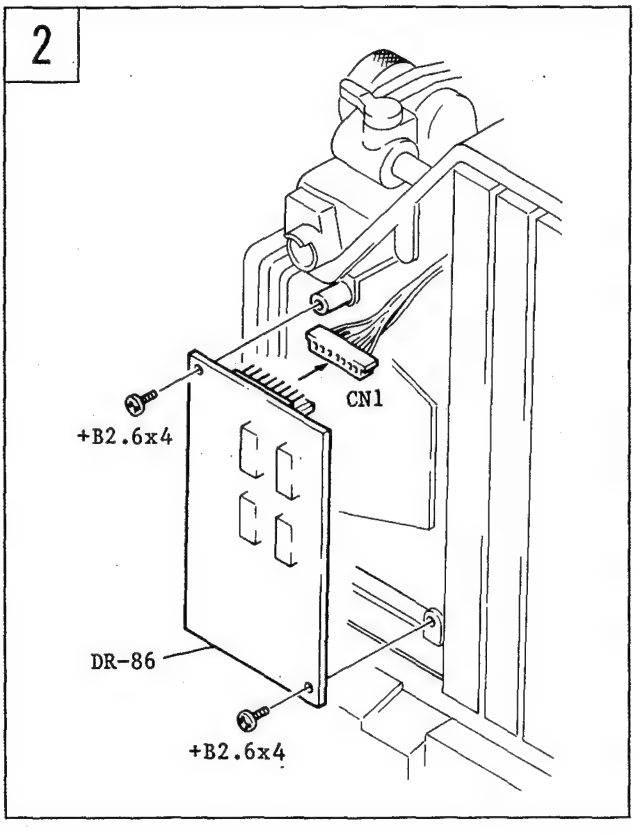
2. Remove the blind sheet and remove the four nuts securing the switches. Pull out the SW-115A board with the switches mounted.



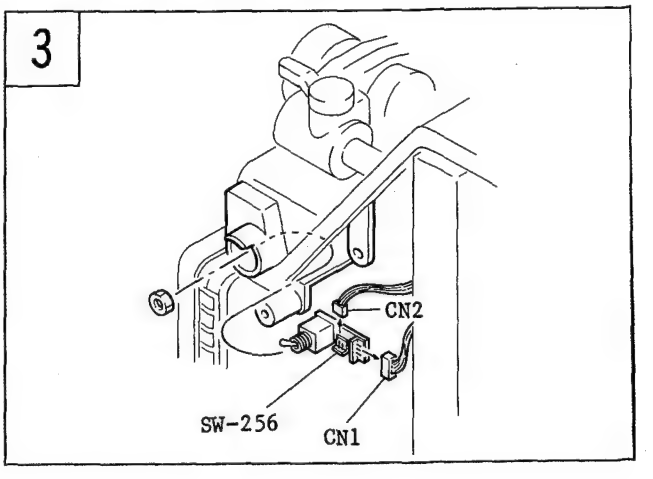
3. Desolder a switch to be replaced for removal. Replace it with a new one.

2-4-2. Replacement of Shutter Switch

1. Remove the right side panel, referring to Section 2-1 "CABINET REMOVAL".
2. Remove the two screws (+B2.6x4). Disconnect the connector CN1 on the DR-86 board and remove the DR-86 board.



3. Disconnect the two connectors, CN1 and CN2 on the SW-256 board. Remove the nut securing the switch and pull out the SW-256 board with the switch mounted.



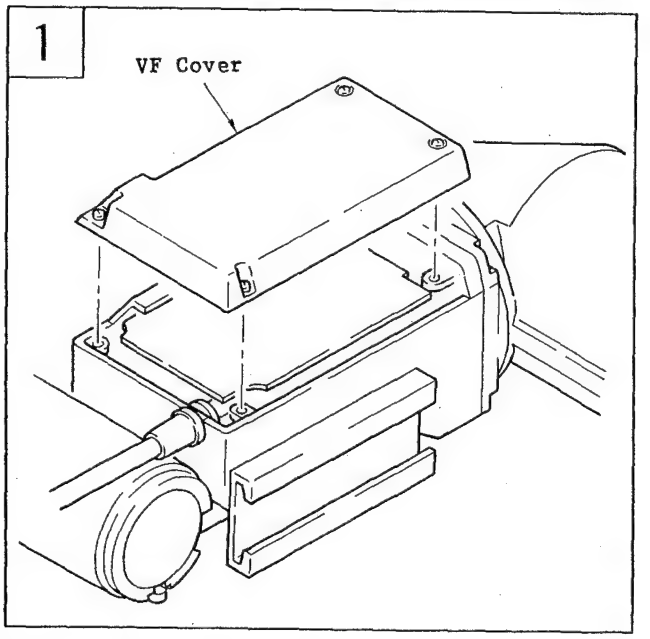
4. Desolder the switch for removal. Replace it with a new one.

2-5. REPLACEMENT OF PARTS FOR VIEWFINDER

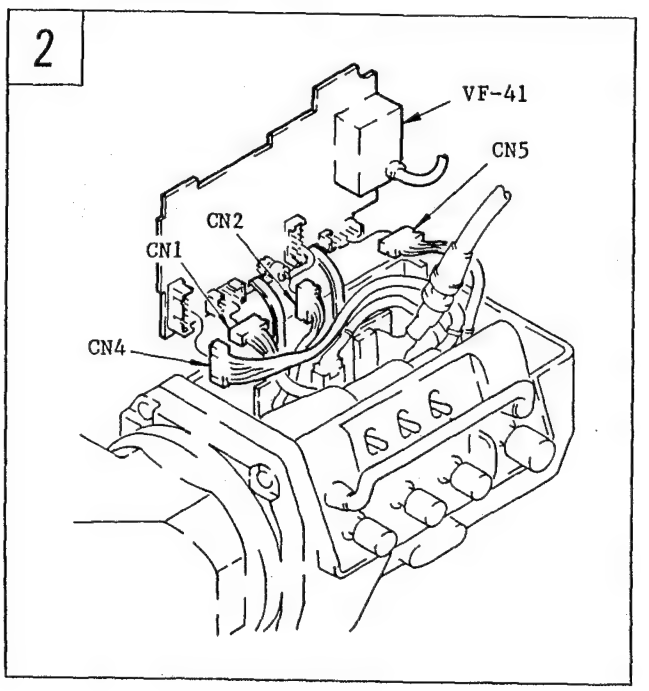
2-5-1. Replacement of CRT

DISASSEMBLE

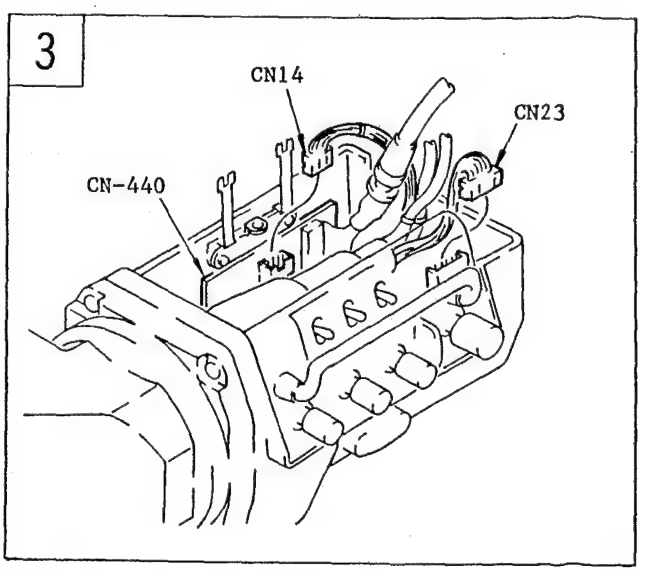
1. Loosen four screws and remove the VF cover.



2. Remove one screw and remove the VF-41 board. Disconnect the connector CN1, CN2, CN4, CN5 and anode cable on the VF-41 board.

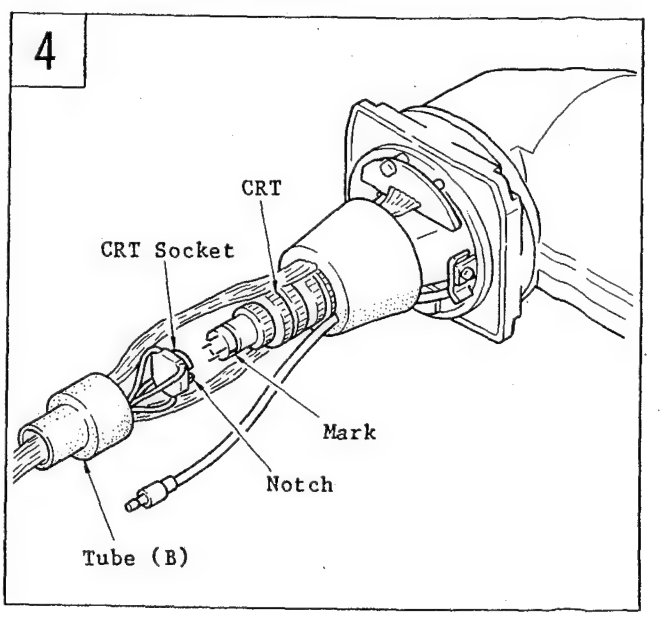


3. Loosen four screws and remove the VF tube. Disconnect the connector CN14 on the CN-440 board. Disconnect the connector CN23 on the VR-108 board.

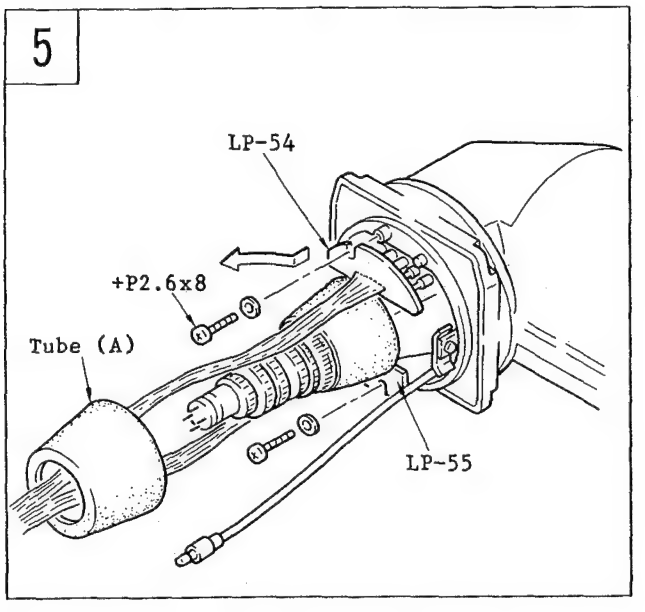


4. Remove the tube (B). Disconnect the CRT socket from the CRT.

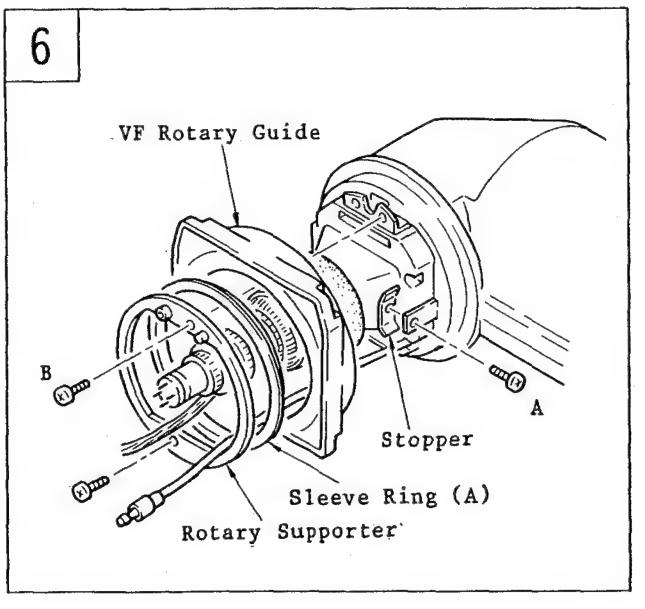
Note: When connecting the CRT socket to the CRT, match a mark on the CRT with a notch of the CRT.



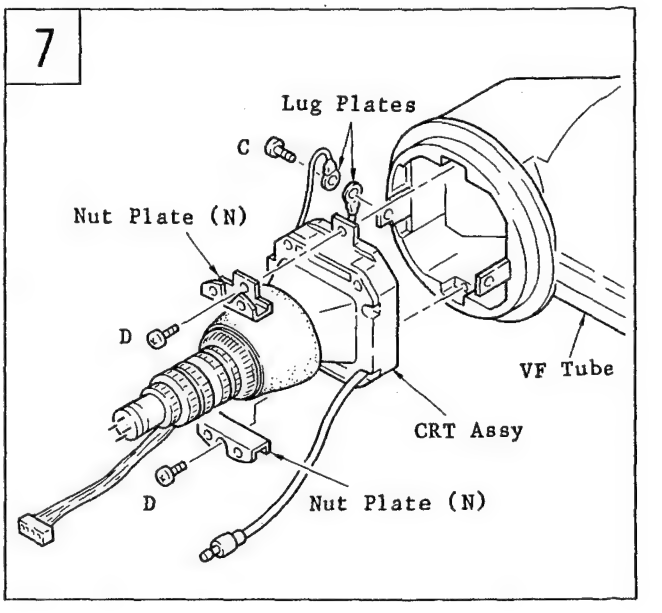
5. Remove the tube (A). Remove two screws and remove the LP-54 and LP-55 boards in the direction of arrow.



6. Remove the screw (A) and remove the stopper. Remove two screws (B) and remove the rotary supporter, sleeve ring (A), VF rotary guide.

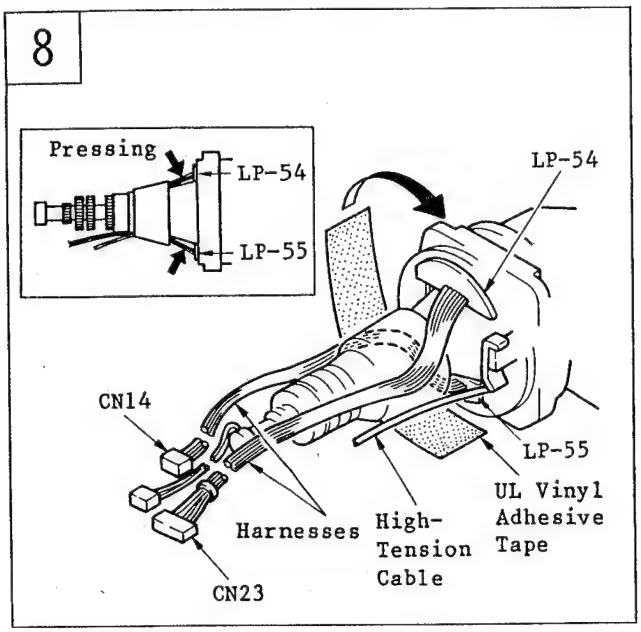


7. Remove the screw (C) and remove the two lug plates. Remove the screw (D) and remove the nut plate. Remove the CRT ASSY from the VF tube.

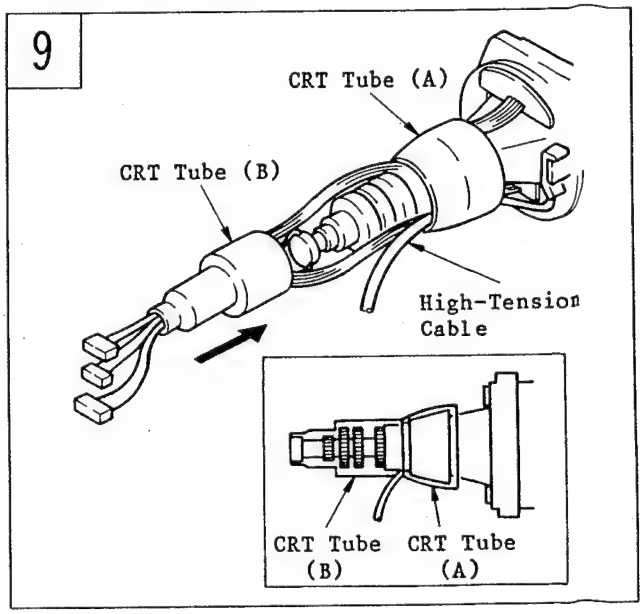


ASSEMBLE

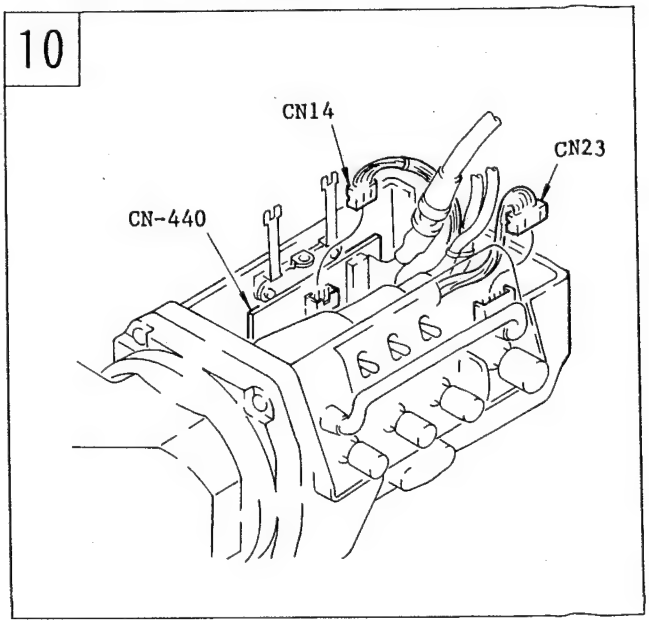
8. Put all wire harnesses from the LP-54 and LP-55 boards together and fasten them with UL vinyl adhesive tape while pressing them in the direction shown by the arrows so that they are not laid on one another.
   The high-tension cable shall be kept straight.
   The tied harnesses should be pushed against the CRT so that they do not bulge out.



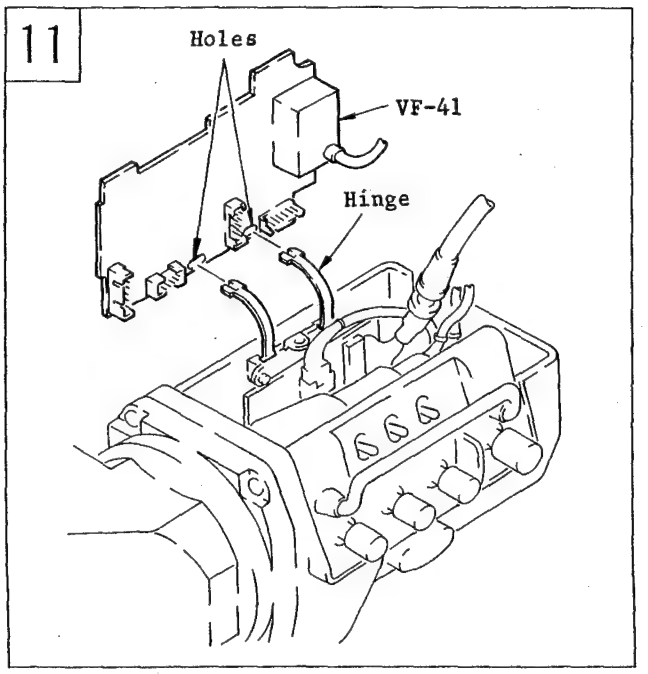
9 Cover the harnesses with CRT tubes (A) and (B) as shown in the figure. Care must be taken so that the harnesses are not slack within the tubes.



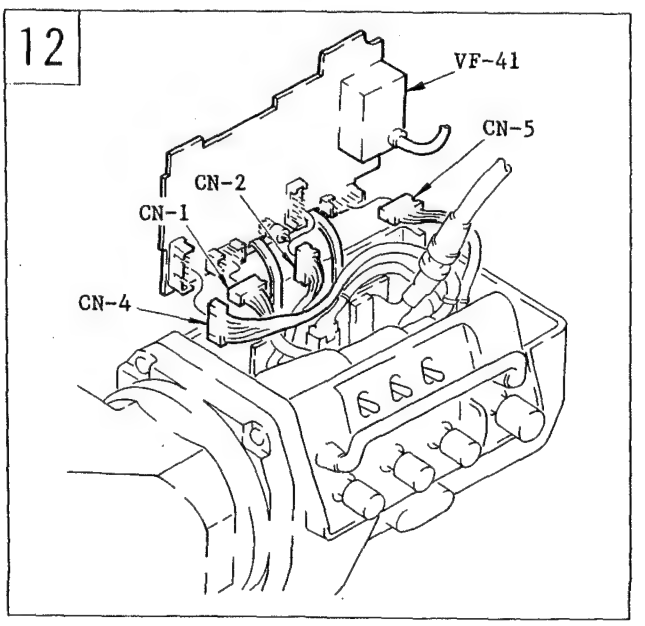
10. Install the VF tube, where the CRT is incorporated, into the VF body so that the harnesses are not placed between the tube and the body.
    Connect the CN23 harness (from the LP-54 board) to the VR-78 board.
    Connect the CN14 harness (from the LP-55 board) to the CN-440 board.



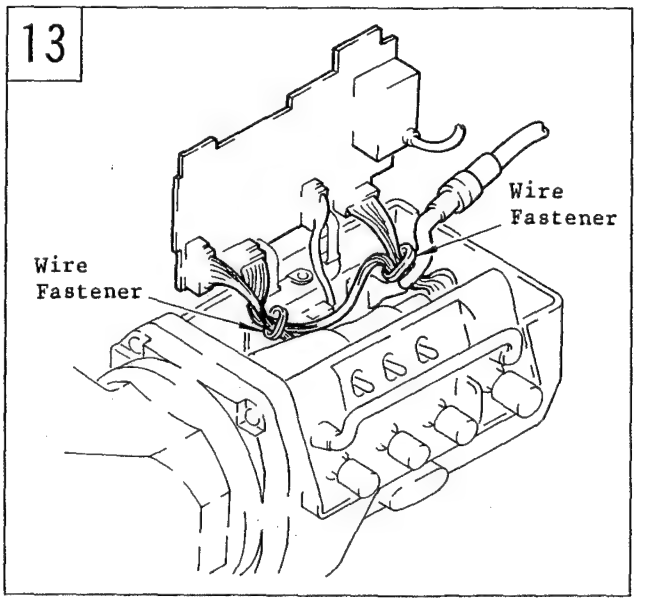
11. Insert the hinge into holes of the VF-41 board.



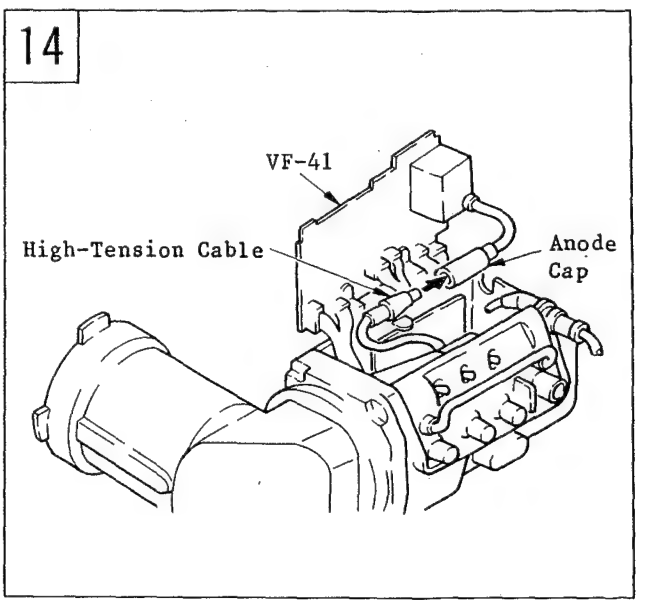
12. Connect CN1, CN2, CN4, and CN5 to the VF-41 board.



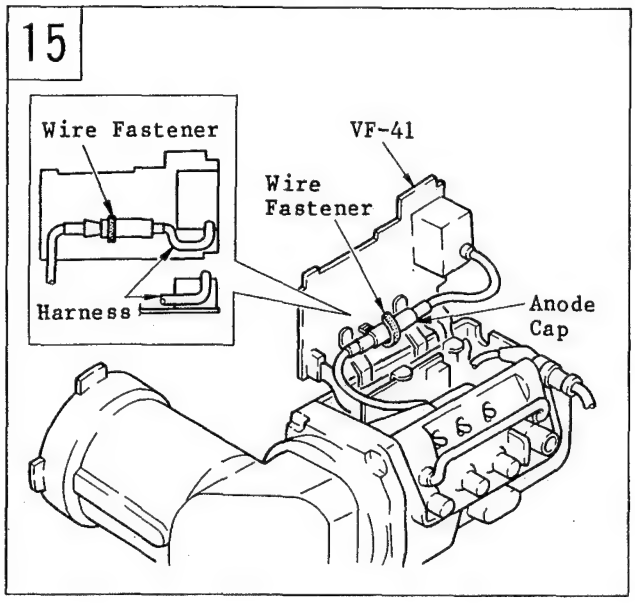
13. Clamp the harnesses with the wire fastener.



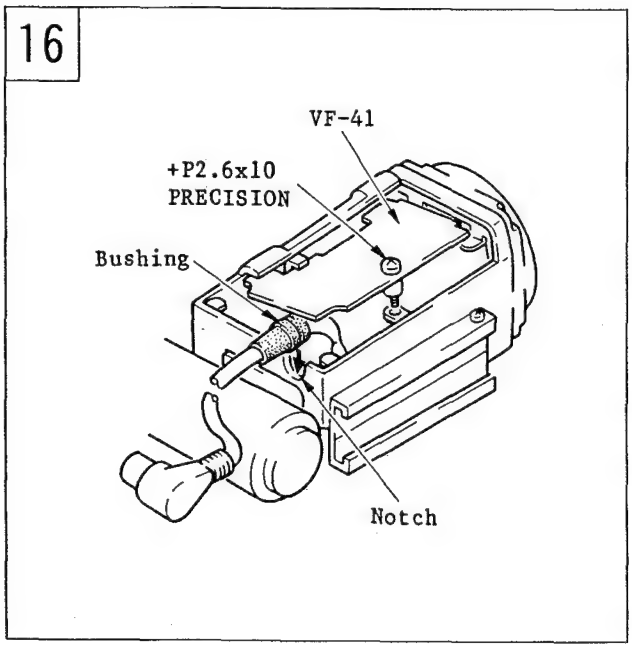
14. Insert the high-tension cable (from the CRT) into the anode cap of the VF-41 board until it locks.



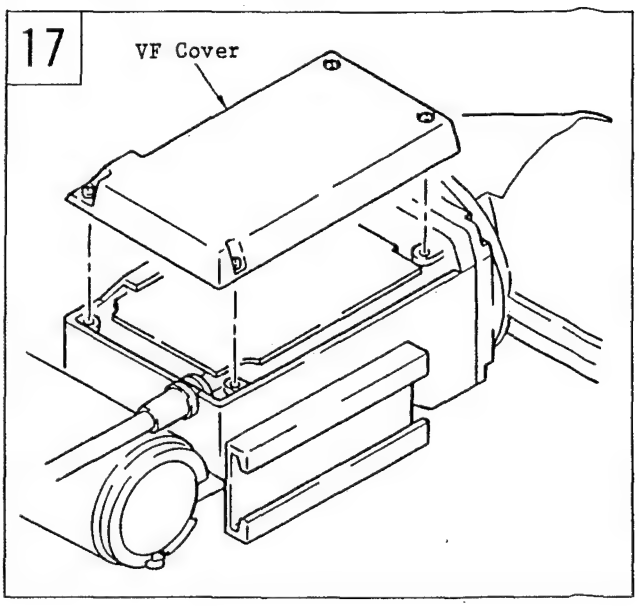
15. Clamp the anode cap in the place shown in the figure with the wire fastener and position the harness at the side of the transformer.



16. Insert the rubber bushing of the VF cable into the notch of the VF body so it matches the shape of the notch and close the VF-41.
Lastly, fasten the VF-41 with the supplied precision screw (+P2.6x10), with the board mounting metals.



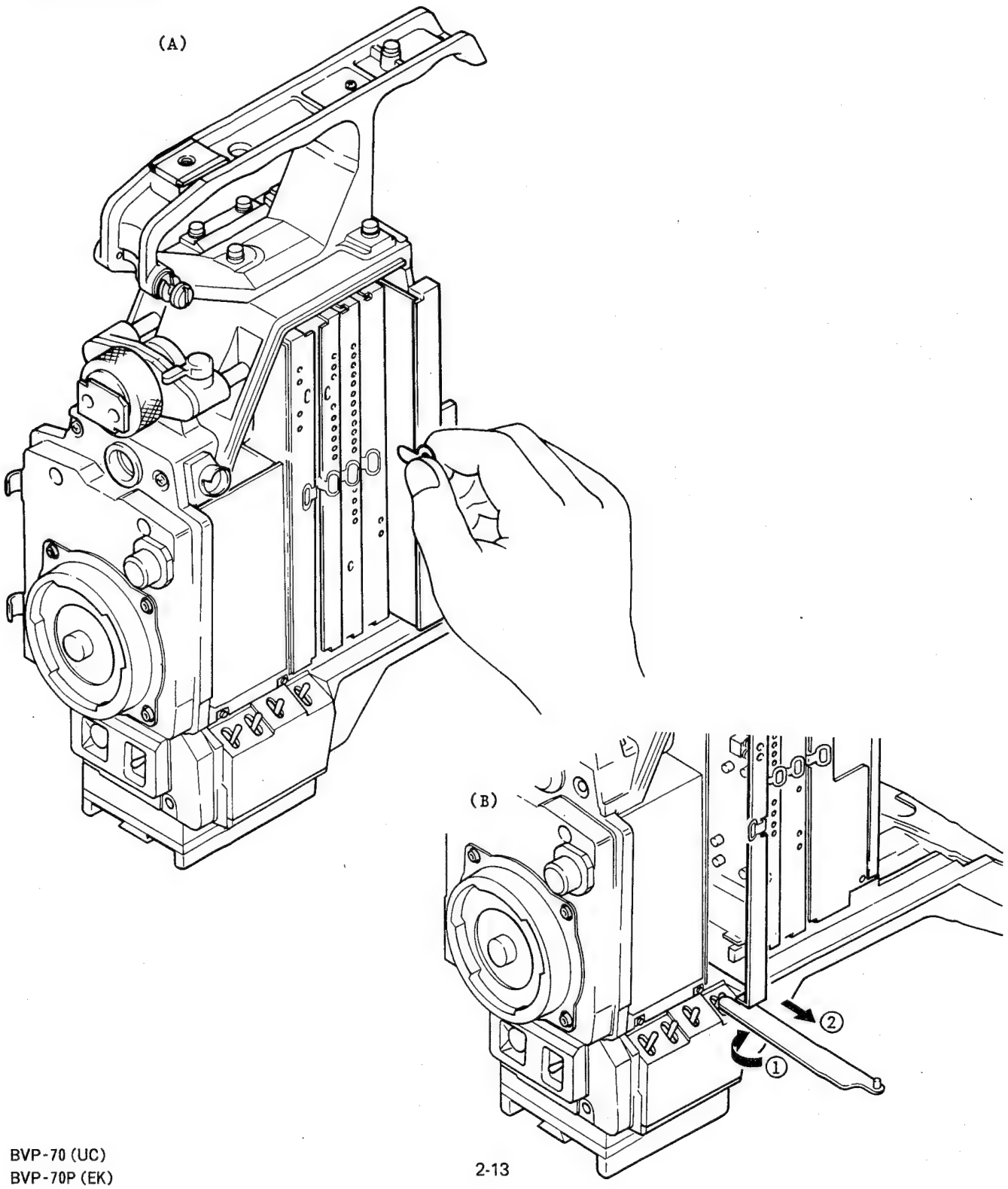
17. Install the VF cover.



2-6. EXTRACTING THE BOARDS

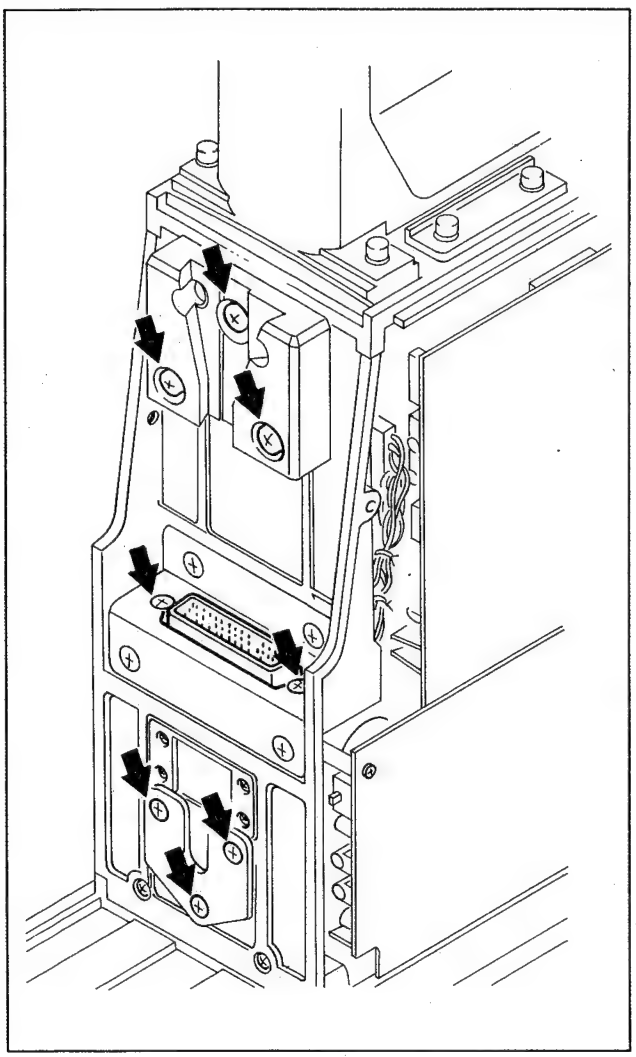
(A) Pull the pull lever attached to each board toward you.

(B) Put the board extractor (supplied accessory) in a hole at the bottom of the board. Move the board extractor in the direction of arrow ①, then pull it in the direction of arrow ②.



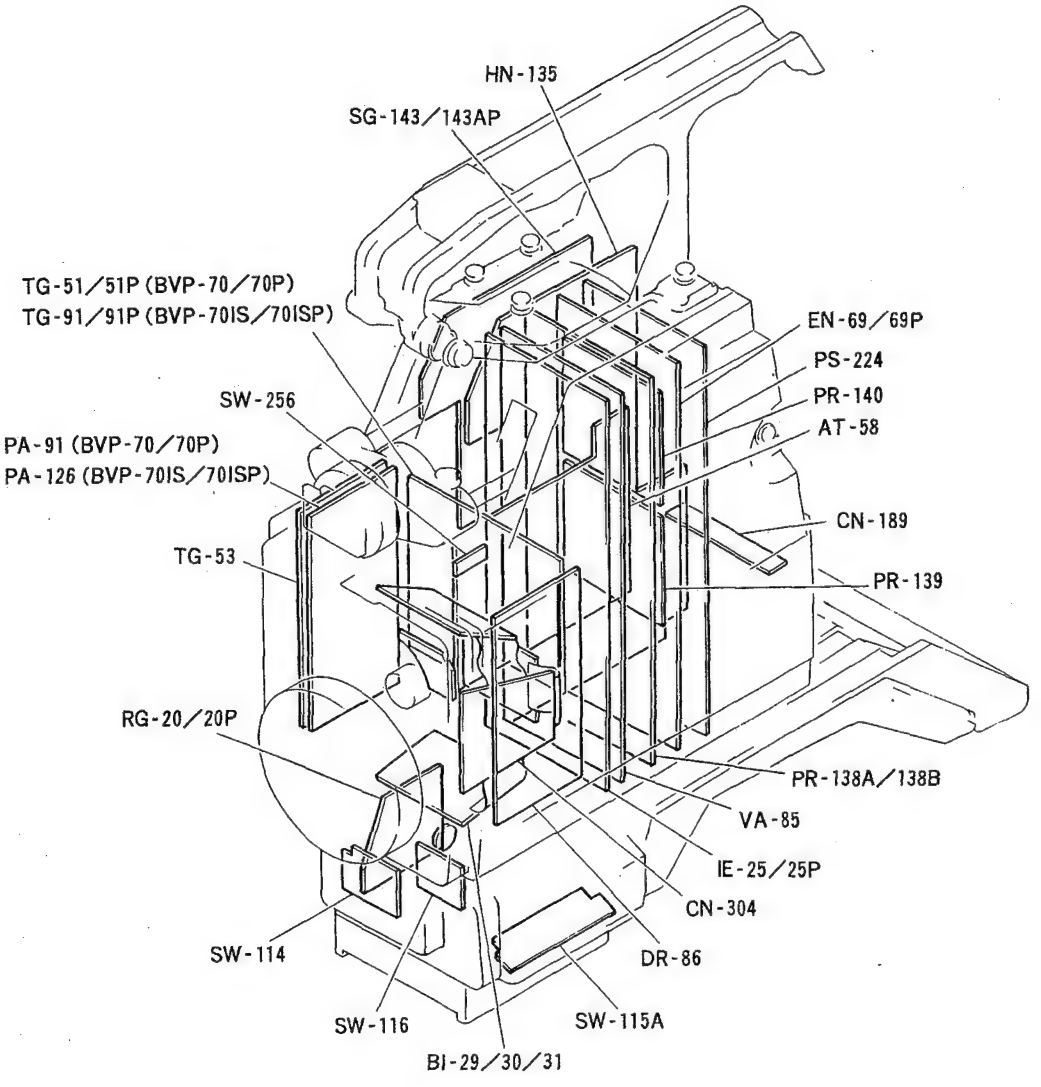
2-7. PRECAUTION ON REPLACEMENT OF VTR CONNECTOR (50P CONNECTOR)

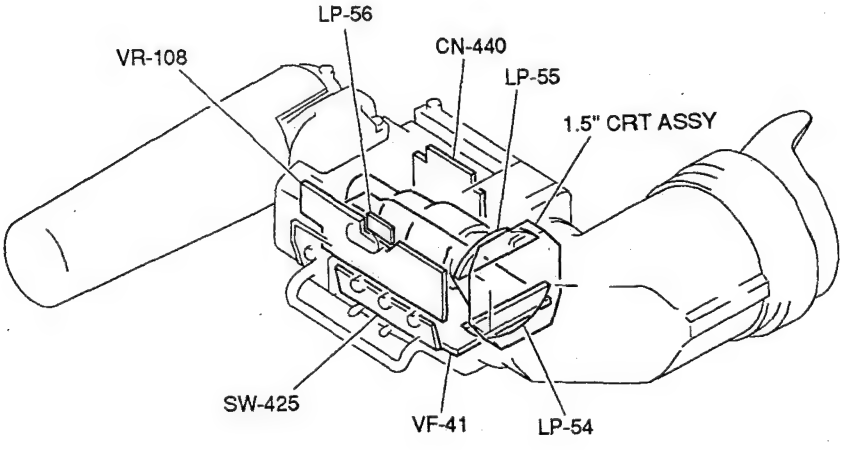
The VTR connector (50-pin connector), camera shoe and chassis should be accurately positioned respectively. When the above parts are replaced, it is necessary to adjust using a high-precision special tool (CV positioning tool) so as to keep the accurate relation and to dock with any of BVV-5.
Avoid loosening or removing the eight screws shown in the figure.
For details, refer to "BETACAM CAMERA manual - Replacement of 50-pin connector -" prepared by Sony Corporation.



SECTION 3
SERVICE INFORMATION

3-1. MAIN PARTS LAYOUT





3-2. CIRCUIT DESCRIPTION

● CCD CONTROL SYSTEM (TG-51/51P, TG-53, DR-86, BI-29, 30, 31, PA-91 boards)

NOTE: In early production units of BVP-70IS/70ISP, TG-51/51P and PA-91 boards were used, However, in current production units, TG-91/91P and PA-126 boards are used.

. TG-51/51P (TG-91/91P) board

It sends the pulse for driving the CCD to DR-86 board and the pulse for sampling the video signal output from the CCD to PA-91 (PA-126) board. Driving pulse synchronizes with the synchronizing signal sent from SG-143/143P board.

14MHz counted down from 28MHz is also supplied to SG-143/143P board.

. DR-86 board

It converts the driving pulse sent from TG-51/51P (TG-91/91P) board so as to drive the CCD directly. Converted pulse is sent to BI-29, 30, 31 boards and transmitted to the CCD.

. BI-29, 30, 31 boards

It mounts the CCD. Driving pulse and DC voltage for control are added to the CCD on the board.

The video signal output from the CCD is sent through the emitter follower to PA-91 (PA-126) board.

. PA-91 (PA-126) board

It eliminates the pulse component of the video signal sent from BI-29, 30, 31 boards. Then the signal processings such as the black level fixing and amplification by preamplifier are performed on the board, then the video signal is sent to VA-85 board.

● VIDEO SIGNAL SYSTEM (VA-85, IE-25/25P, PR-138A/138B, EN-69/69P boards)

. VA-85 board

It amplifies the video signal sent from PA-91 (PA-126) board and processes the black shading correction, gain-up control, blanking cleaning and white shading correction. It also selects the video signal or the TEST SAW signal.

. IE-25/25P board

It generates the detail signal obtained from G and R video signal so as to improve resolution. The detail signal is sent to PR-138A/138B board, then added to R, G and B video signals.

G video signal is delayed by 1H, then sent to PR-138A/138B board.

. PR-138A/138B board

The masking signal and detail signal are added to R, G and B video signals respectively and the flare compensation, pedestal control, knee correction, white clipping and gamma correction are performed on the board. Then the video signal is sent to EN-69/69P board.

. EN-69/69P board

It generates the luminance (Y) signal, color difference (B-Y, R-Y) signals and composite video (VBS) signal obtained from R, G and B video signals. It also supplies the SMPTE: NTSC (EBU:PAL) color-bar signals.

● POWER SUPPLY SYSTEM (PS-224 board)

. PS-224 board

Externally supplied unregulated DC power is sent to the switching regulator, DC to DC converter and series regulator to generate voltages of +8.8Vdc, +5Vdc and -5Vdc for the respective boards.

It also supplies voltages for the VIEWFINDER and for CCD control.

SYNCHRONIZING SIGNAL SYSTEM (SG-143/143AP board)

. SG-143/143AP board

It generates various synchronizing signals.

It detects the genlock signal automatically and synchronizes with it.

● AUTOMATIC CONTROL SYSTEM (AT-58, PS-224 boards)

. AT-58 board

Microcomputer unit on AT-58 board sends to the control signal and compensation signal to appropriate boards in accordance with the selection of function switches.

It also detects the internal temperature, position of color temperature conversion filter, PEDESTAL control and video level automatically, then compensates the video signals and displays various warnings.

. PS-224 board

If contains the auto iris circuit and VTR-CAMERA interface circuit.

The former detects the video level at any time and adjusts the iris control.

The latter controls the input and output of the START/STOP control signal and warning signal between camera and VTR.

3-3. SERVICING PRECAUTION

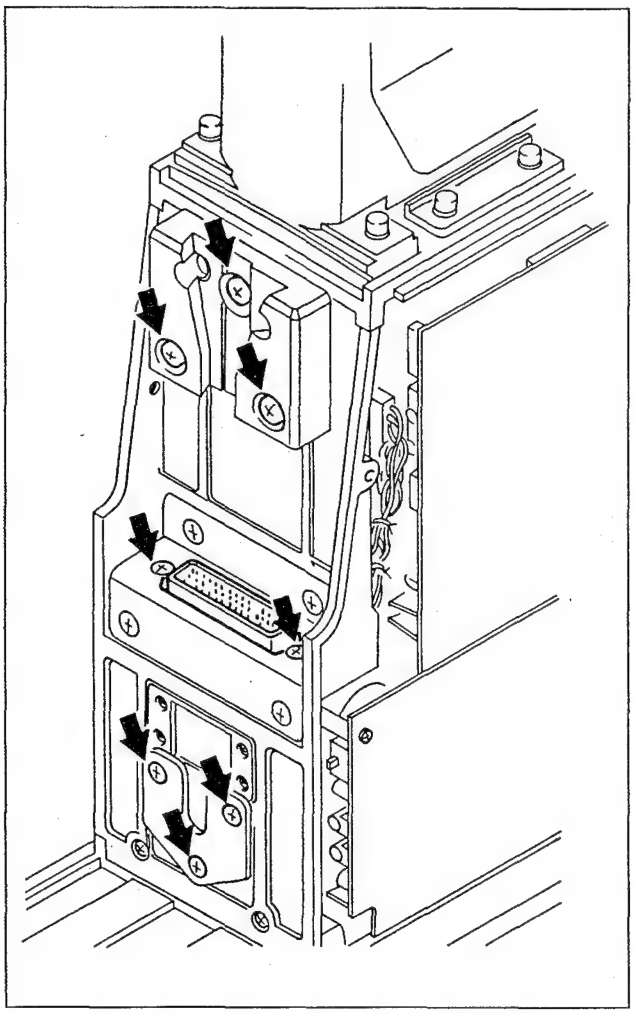
3-3-1. Precautions on Replacement of VTR Connector (50P Connector)

The VTR connector (50 pin connector) is attached using a high-precision special tool (CV positioning) so as to keep the accurate positioning relation with VTR mount (C shoe) and to dock with any of BVV-1/1PS, BVV-1A/1APS and BVV-5/5PS.

Avoid to loosen or remove the screws for 50P connector, C SHOE and stopper (in all, eight screws).

It is necessary to adjust using a jig, when the above parts are replaced.

For replacement of the VTR connector (50-pin connector), contact your Sony dealer.



3-3-2. Warning of CCD Image Sensor Replacement

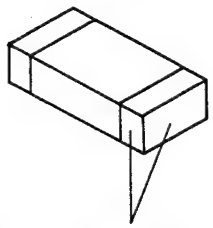
The BI-29, 30, 31 boards on which the CCD is mounted had better not be removed.

When removing it, the CCD is sometimes broken by the static electricity.

If the CCD is broken, the whole CCD unit must be replaced.

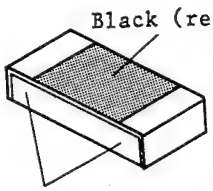
3-3-3. Precaution on Replacement of Chip Parts

Capacitor



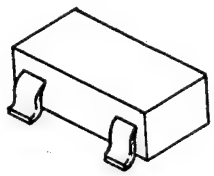
Covered with electrode.

Resistor



Not covered with electrode.

Diode and Transistor



Tools required:

Soldering iron of approx. 20W
(Use a temperature controller, if possible, which can control the iron temperature to 270±10°C.)
Braided wire (SOLDER TAUL)
Solder (A solder of 0.6mm in diameter is recommended.)
Tweezers

Soldering conditions:

Iron temperature of 270±10°C
A connector should be soldered within 2 seconds.

The chip parts removed should not be used again.

For details, refer to CHIP COMPONENTS MANUAL, Sony's parts No. 9-972-289-91 prepared by Sony Corporation.

Procedures

1. To remove a resistor or capacitor, place the tip of a soldering iron on chip parts to heat the parts, and then move it horizontally for removal while being desoldered. For removal of a diode or transistor, heat the one side, with two pins, of chip parts at the same time, set the parts up when desoldered, and remove the two pins. And then, remove the pin on another side.

2. Absorb solder by using a braided wire to smooth the land surface of board after removal.

3. Confirm by visual check that no trace of the removed chip parts is peeled off and no adjacent parts is damaged or bridged.

4. Perform a thin pretinning on the trace.

5. Place new chip parts on the trace to solder its both sides.

3-3-4. Precaution of Replacement Parts

1. Safety Related on Components Warning
   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Standardization of Parts
   Replace Parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."
   - This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present."
   - Regarding engineering parts and diagrams changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. Stocked of Parts
   The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts marked with "0" will be proceed, but allow for additional delivery time.

4. Units of Capacitors, Inductors, and Resistors
   The following units are omitted in the schematic diagrams, exploded views, and electrical part lists unless otherwise specified;
   Capacitor: μF
   Inductor : μH
   Resistor : Ω

3-4. TOOLS AND JIGS

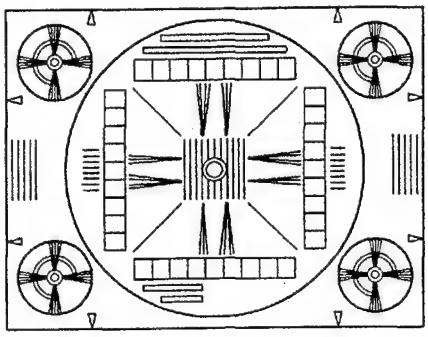
Part No.	Description
A-7520-253-A	Extension board "EX-108" (supplied)
J-6026-100-A	Resolution chart
J-6026-110-A	Multi-burst chart
J-6026-120-A	Registration chart
J-6026-130-B	Gray-scale chart
J-6029-140-A	Pattern box "PTB-500"
J-6196-080-B	DC Power cord
3-692-589-01	Board Extractor
7-700-733-01	Adjusting screwdriver (1.5mm/4mm)

SECTION 4
ALIGNMENT

4-1. PREPARATION

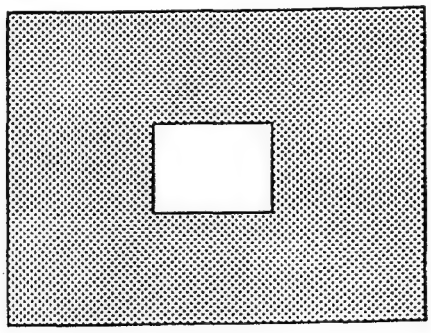
4-1-1. Adjustment Fixtures and Equipment

J-6026-100-A	Resolution Chart



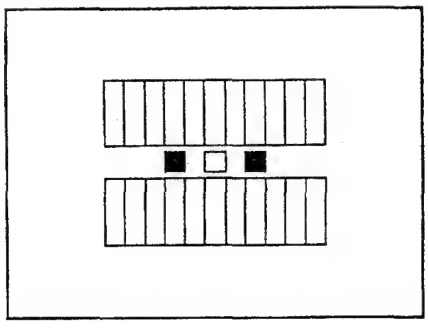
White Window Chart

Make a hole in the center of black paper as shown in the figure.



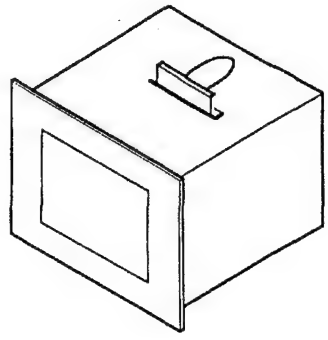
J-6026-130-B	Gray Scale Chart

Stick the velvet (black) at the both sides of while pattern in the center to avoid the light leakage.



J-6029-140-A	Pattern Box PTB-500

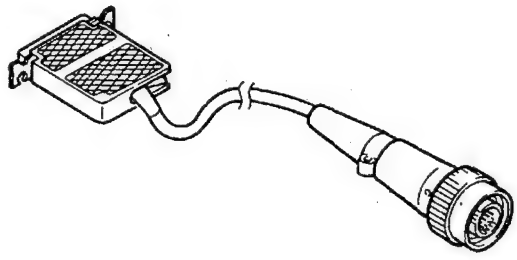
PTB-100 is also available.



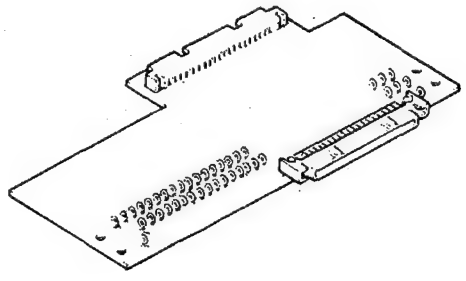
J-6026-110-A	Burst Chart

J-6196-080-B	DC Power Cord

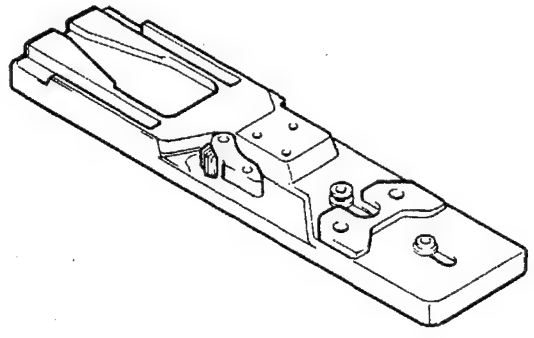
Necessary without CA-50P/3A



A-7520-253-A	Extension board (EX-108)



	Tripod Adaptor (VCT-14)

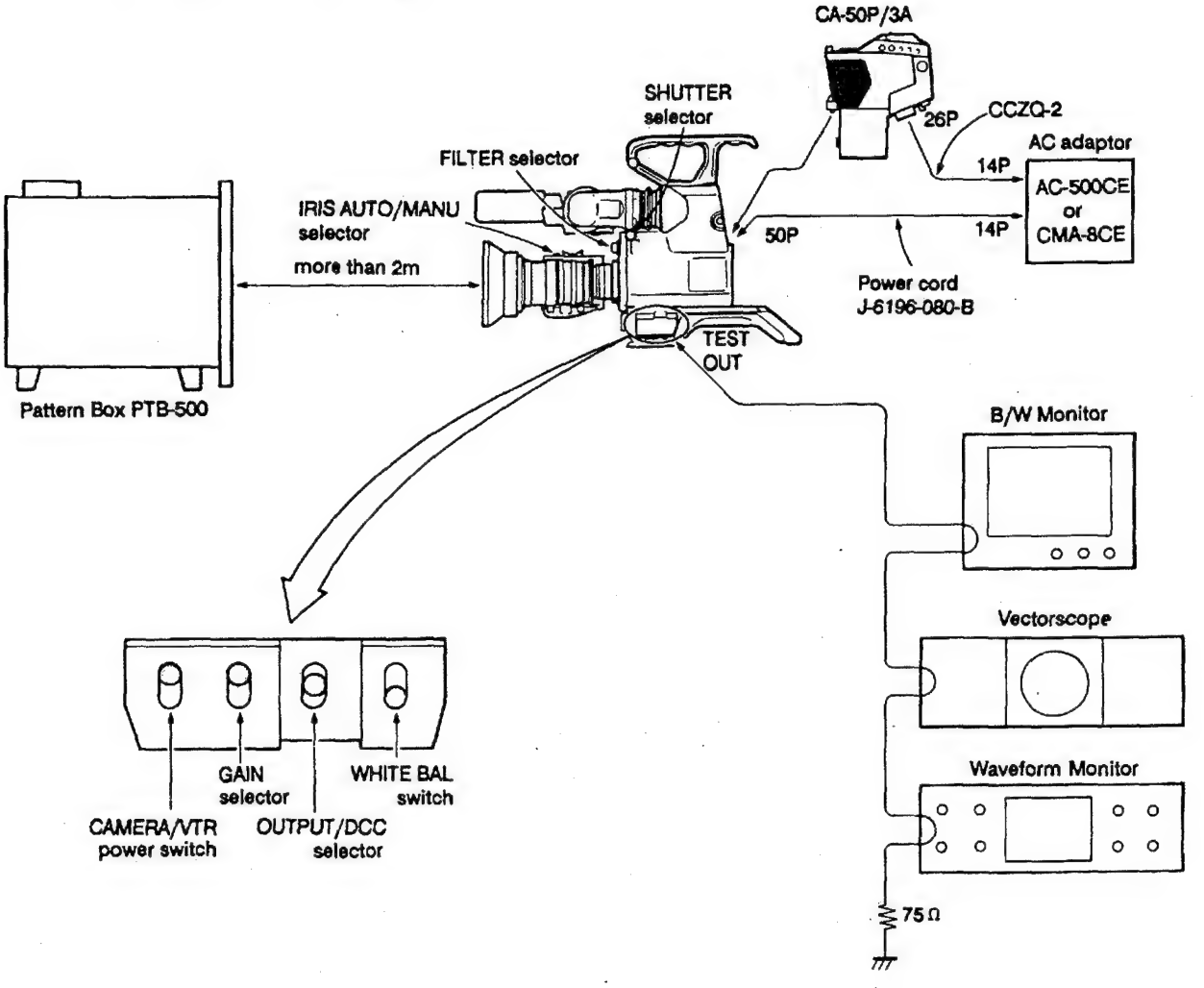


- Camera Adaptor (Sony CA-50P/3A)
- AC Adaptor (Sony AC-500CE or CMA-8CE)
- SC-H Phase Measuring Instrument(Tektronix 1751 or equivalent)

Measuring Instruments

- Oscilloscope
- Waveform Monitor
- Vectorscope
- Frequency Counter
- Digital Voltmeter
- B/W Monitor (H Resolution ; more than 700 TV lines)

4-1-2. Connection and Initial Setting



1. Before adjustmens, set the CAMERA/VTR power switch to "ON/STBY" position and warm up for ten minutes.
2. Reset the compensation data in the microprocessor. (See 4-1-3.Precaution of Adjustments)
3. Set the camera switches and controls as follows.

[Side panel]	
CAMERA/VTR power switch:	ON/STBY
GAIN selector:	0
OUTPUT/DCC selector:	CAM/OFF
WHITE/BAL switch:	PRESET
FILTER selector:	1(3200 K)
IRIS AUTO/MANU selector:	MANU
IRIS control:	CLOSE
SHUTTER switch:	OFF
[IE-25P board]	
S1 (DTL):	OFF
S2 (APERTURE):	OFF
[PR-138A board]	
S1 (MASKING):	OFF

4-1-3. Precaution on Adjustments

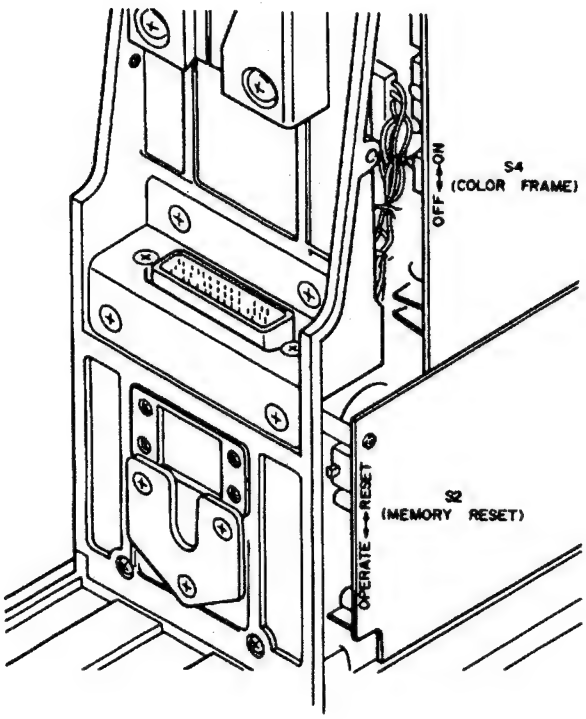
Boards Extension

When IE-25P, VA-85, PR-138A, EN-69P, and SG-143P boards are extended or returned, be sure to set the CAMERA/VTR power switch to PREHEAT/SAVE position. When PS-224 board is extended or returned, be sure to set the switch of original power supply to OFF position.

Procedure of Resetting Compensation Data

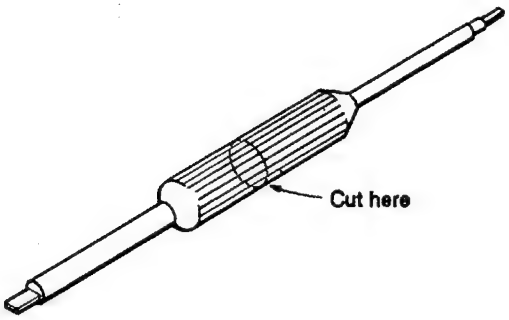
Before step 3-14.Black Set Pedestal Adjustment and step 3-15.Flare Adjustment are carried out,the compensation data in the microprocessor must be reset in following order.

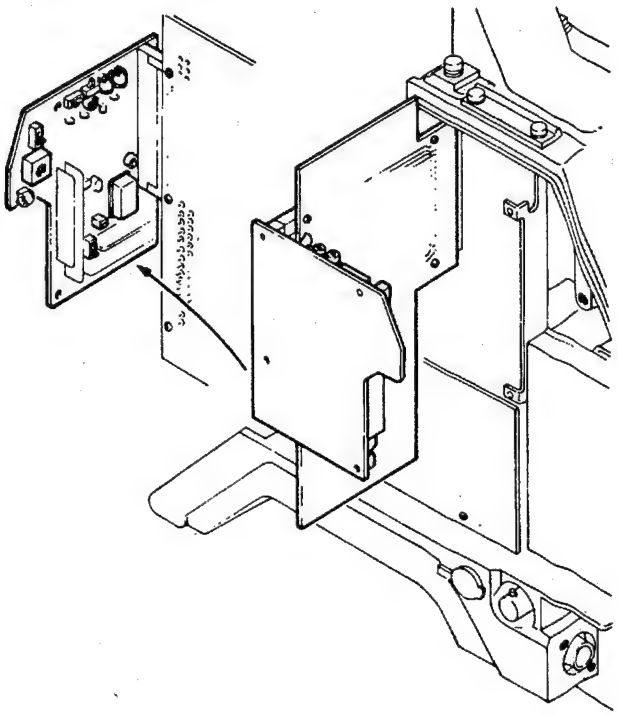
1. S2(MEMORY RESET)/AT-58 board → "RESET"
2. CAMERA/VTR power switch (side panel) → "PRE HEAT/SAVE"
   Keep this switch position for ten seconds.
3. CAMERA/VTR power switch (side panel) → "ON/STBY"
4. S2 (MEMORY RESET)/AT-58 board → "OPERATE"
   When the AUTO W/B BAL switch is not set to BLK or WHT position, the compensation data remains cleared (initial condition).
   When the S2(MEMORY RESET) /AT-58 board switch is reset whenever the CAMERA/VTR power switch is set to OFF/SAVE position. Set the S2 switch to RESET position during adjustment.



SG-143P board adjustment

When step 2-2.SYNC WIDTH adjustment, step2-5.H BLKG adjustment and step 2-7.INT SC phase adjustment are carried out, a screw driver with short handle is necessary for adjustments.





Earthing point

Use the GND terminal on the extension board,unless otherwise specified.

4-2. OVERALL ADJUSTMENT

STEP 1. POWER SUPPLY SYSTEM
STEP 1-1. DC Bias adjustment
STEP 1-2. Switching Frequency adjustment
STEP 1-3. +9.3V/+8.8V adjustment
STEP 1-4. IRIS Weighting adjustment

STEP 2.SYNCHRONIZING SIGNAL SYSTEM
STEP 2-1. Subcarrier frequency adjustment
STEP 2-2. SYNC width adjustment
STEP 2-3. SYNC phase adjustment
STEP 2-4. Burst flag adjustment
STEP 2-5. H BLKG width adjustment
STEP 2-6. INT SC phase adjustment

STEP 3.VIDEO SIGNAL SYSTEM
STEP 3-1. DC bias adjustment
STEP 3-2. VA Gain adjustment
STEP 3-3. Pre-Black set adjustment
STEP 3-4. VA Clip Level adjustment
STEP 3-5. Test signal waveform adjustment
STEP 3-6. Pre-Knee adjustment
STEP 3-7. Modulation Balance adjustment
STEP 3-8. Black Shading adjustment
STEP 3-9. White Shading adjustment
STEP 3-10. PR IN Gain adjustment
STEP 3-11. Pre-Pedestal level and PR OUT Gain adjustment
STEP 3-12. Gamma Balance adjustment
STEP 3-13. Flare DC Balance adjustment
STEP 3-14. Carrier Balance adjustment
STEP 3-15. Black-set and Pedestal adjustment
STEP 3-16. Flare adjustment
STEP 3-17. R,G,and B Video level adjustment
STEP 3-18. EN-Y Level adjustment
STEP 3-19. Color-bar adjustment
STEP 3-20. UV Gain adjustment
STEP 3-21. Burst adjustment
STEP 3-22. VTR Y Gain adjustment
STEP 3-23. VTR R-Y Gain adjustment
STEP 3-24. VTR B-Y Gain adjustment
STEP 3-25. Zebra Level adjustment
STEP 3-26. Gamma correction adjustment
STEP 3-27. Manual Knee and white clip adjustment
STEP 3-28. Automatic Knee adjustment

STEP 4. IMAGE ENHUNCER SYSTEM
STEP 4-1. Clip Level adjustment
STEP 4-2. V DTL Null adjustment
STEP 4-3. DTL Black Clip adjustment
STEP 4-4. DTL Alias adjustment
STEP 4-5. H DTL NULL adjustment
STEP 4-6. Black Balance adjustment
STEP 4-7. Clispening adjustment
STEP 4-8. Level Dependent adjustment
STEP 4-9. Aperture Alias adjustment
STEP 4-10. Aperture Null adjustment
STEP 4-11. H/V RATIO adjustment
STEP 4-12. Aperture adjustment
STEP 4-13. Detail Level adjustment

STEP 5. RESOLUTION ADJUSTMENT

STEP 6. POWER SAVE ADJUSTMENT

STEP 7. AUTO CONTROL SYSTEM
STEP 7-1. Auto iris adjustment
STEP 7-2. LOW VIDEO adjustment
STEP 7-3. Character Size adjustment

STEP 8. VIEWFINDER SYSTEM
STEP 8-1. Preparation for Viewfinder system adjustment
STEP 8-2. Vertical Hold adjustment
STEP 8-3. Horizontal Hold adjustment
STEP 8-4. DC Balance adjustment
STEP 8-5. BRIGHT SET adjustment
STEP 8-6. Focus adjustment
STEP 8-7. Picture Frame adjustment
STEP 8-8. PEAKING adjustment

STEP 1. POWER SUPPLY SYSTEM

STEP 1-1. DC Bias adjustment

↓

STEP 1-2. Switching Frequency adjustment

↓

STEP 1-3. +9.3V/+8.8V adjustment

↓

STEP 1-4. IRIS Weighting adjustment

↓

STEP 2. Synchronizing signal system

↓

STEP 3. Video signal system

↓

STEP 4. Image Enhuncer system

↓

STEP 5. Resolution adjustment

↓

STEP 6. Power Save adjustment

↓

STEP 7. Auto control system

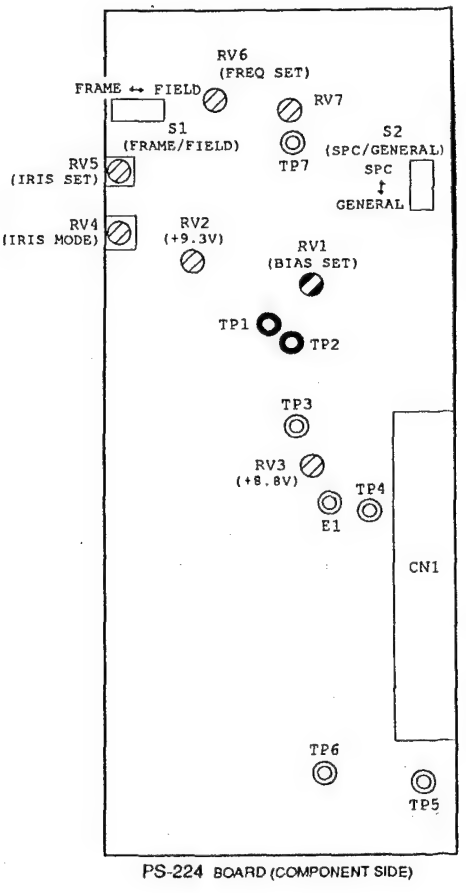
↓

STEP 8. Viewfinder system

STEP 1-1. DC Bias adjustment

Note: 1. *The adjustment is not necessary if error is within ±3% of rated voltage.*
2. When performing this adjustment,be sure to readjust all of the following (to STEP 8-7. Picture Frame adjustment).

Equipment: Digital voltmeter
To be extended: PS-224 board
Trigger:
Preparation



PS-224 BOARD (COMPONENT SIDE)

Object:

Monitor screen	Waveform monitor

Lens Zoom:

Lens iris:

Test point: Measure TP1 between TP1 (+) and TP2 (–) on the PS-224 board.

Adjust point: ⊘ RV1(BIAS SET)/PS-224 board

Specification: +1.83 ± 0.01 Vdc

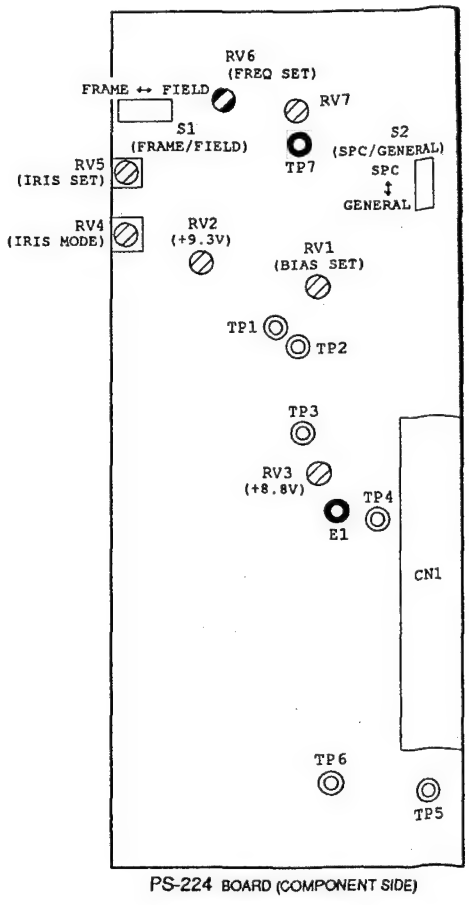
Adjustment procedurs

Note:

STEP 1-2. Switching Frequencu adjustment

Note: The adjustment is not necessary if error is within ± 2% of rated voltage.

Equipment: Frequency counter
To be extended: PS-224 board
Trigger:
Preparation



PS-224 BOARD (COMPONENT SIDE)

Object:

Monitor screen — Waveform monitor

Lens Zoom:

Lens iris:

Test point: TP7(GND:E1)/PS-224 board
Adjust point: RV6(FREQ SET)/PS-224 board

Specification: 36.5 ± 0.8 kHz

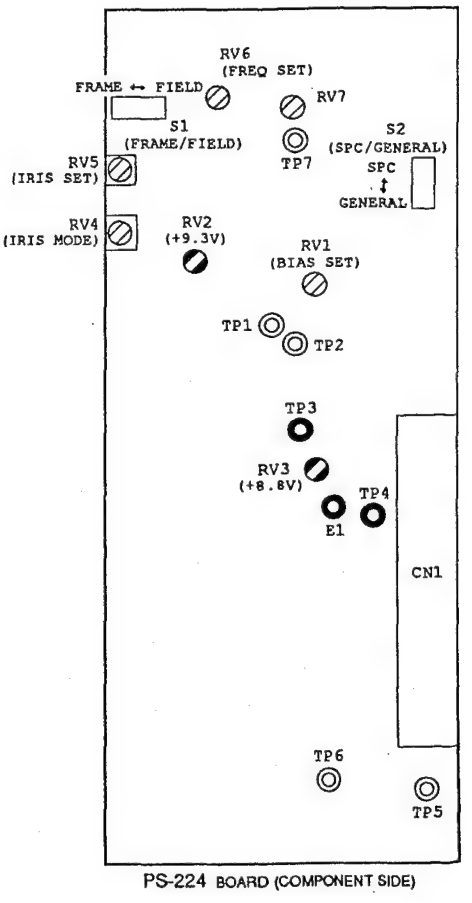
Adjustment procedurs

Note:

STEP 1-3. +9.3/+8.8 V adjustment

Note: 1. The adjustment is not necessary if error is within 3% of rated voltage.
2. When performing this adjustment,be sure to readjust all of the following (to STEP 8-7.Picture Frame adjustment)

Equipment: Digital voltmeter
To be extended: PS-224 board
Trigger:
Preparation



PS-224 BOARD (COMPONENT SIDE)

Object:

Monitor screen Waveform monitor

Lens Zoom:

Lens iris:

Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedurs

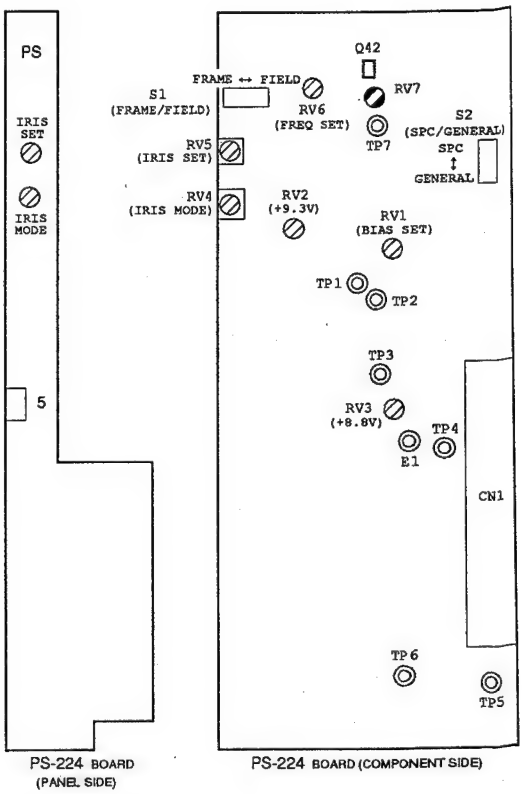
	Test point /PS-224	Adjust point /PS-224	Spec.:
+9.3V adjustment	TP3 (GND:E1)	⊘ RV2	+9.3 ± 0.01Vdc
+8.8V adjustment	TP4 (GND:E1)	⊘ RV3	+8.8 ± 0.01Vdc

Note:

STEP 1-4. IRIS Weighting adjustment

Note:

Equipment: Oscilloscope
To be extended: PS-224 board
Trigger: V-SAW(TP-29/extension board)
Preparation:



Object:

Monitor screen	Waveform monitor

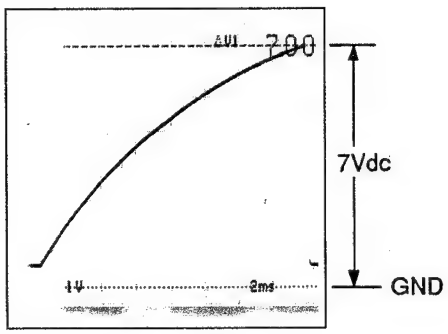
Lens Zoom:

Lens iris:

Test point: Q42 Emitter/PS-224 board
Adjust point: RV-7/PS-224 board

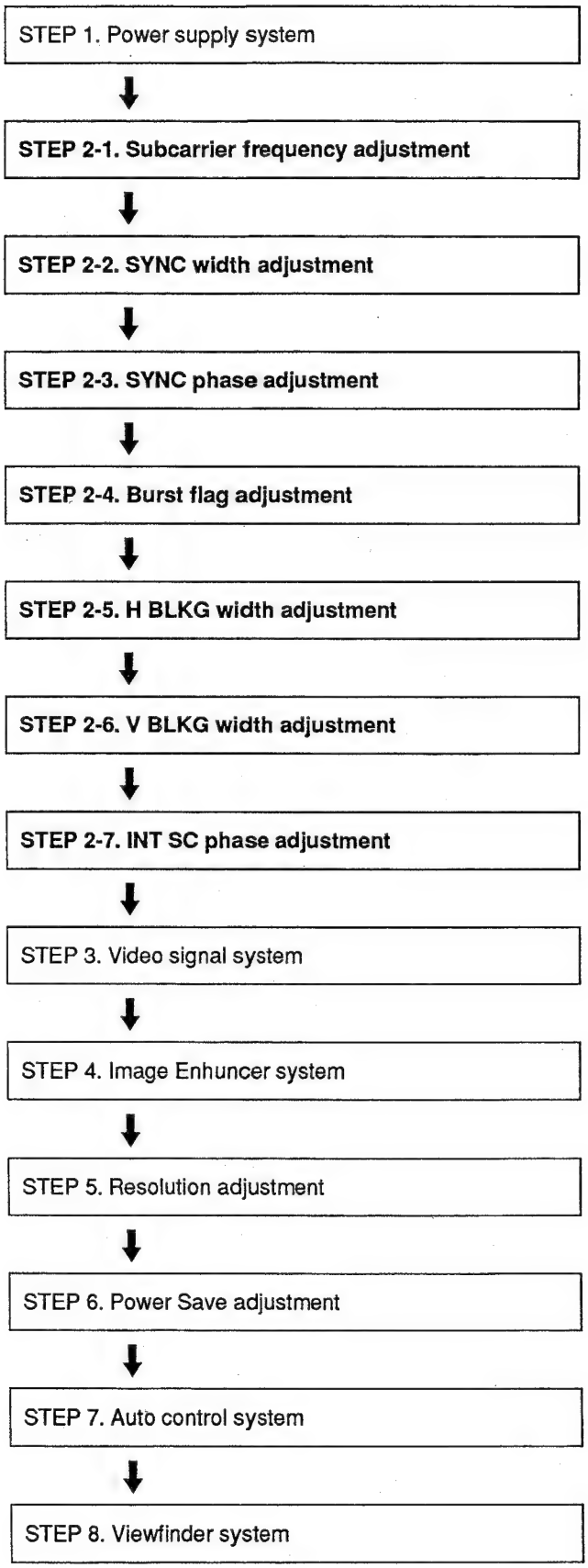
Specification: mentioned below

Adjustment procedures:



Note:

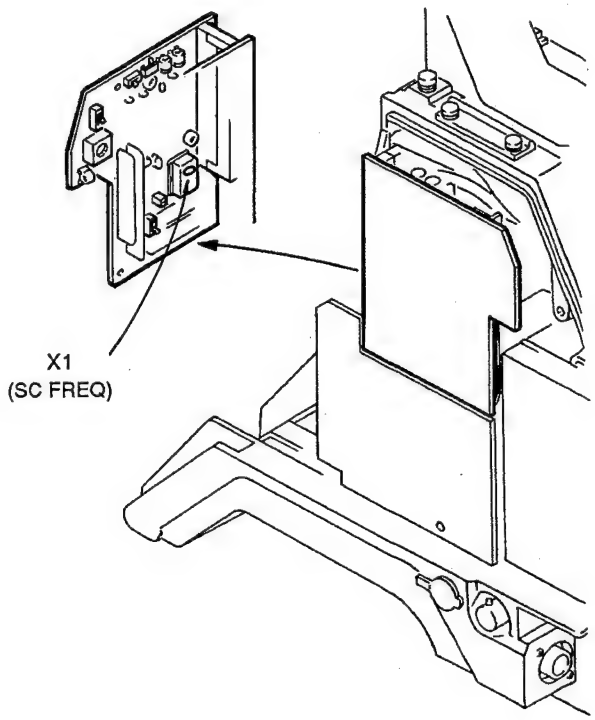
STEP 2. SYNCHRONIZING SIGNAL SYSTEM



STEP 2-1. Subcarrier frequency adjustment

Note: 1. Before adjustment, set the CAMERA/VTR power switch to ON/STBY position and warm up for ten minutes.
2. Make sure that the camera is not in GENLOCK mode.

Equipment: Frequency counter
To be extended: SG-143P board
Trigger:
Preparation



Object:

Monitor screen — Waveform monitor

Lens Zoom:

Lens iris:

Test point: TP26(GND:TP25)/extension board
Adjust point: X1(SC FREQ)/SG-143P board

Specification: 4,433,619 ± 5Hz

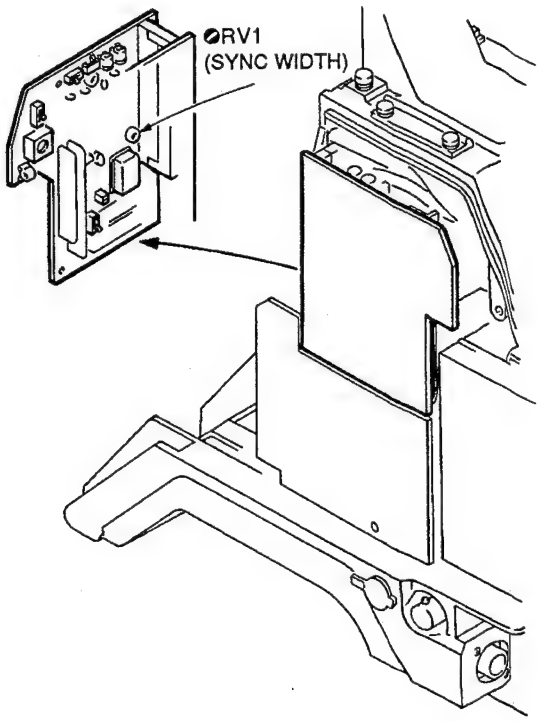
Adjustment procedurs

Note:

STEP 2-2. SYNC width adjustment

Note:

Equipment: Waveform monitor (WFM)
To be extended: SG-143P board
Trigger:
Preparation
ENC/RGB switch (side panel) "ENC"



Object:

Monitor screen Waveform monitor

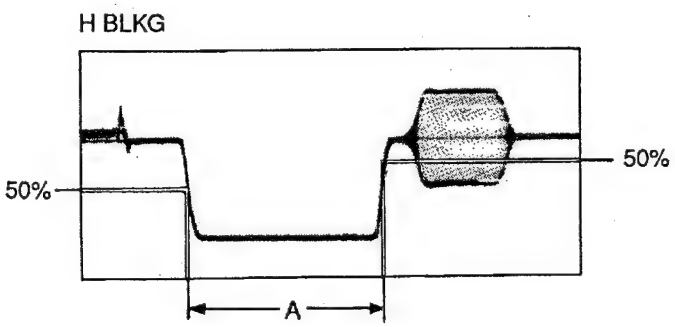
Lens Zoom:

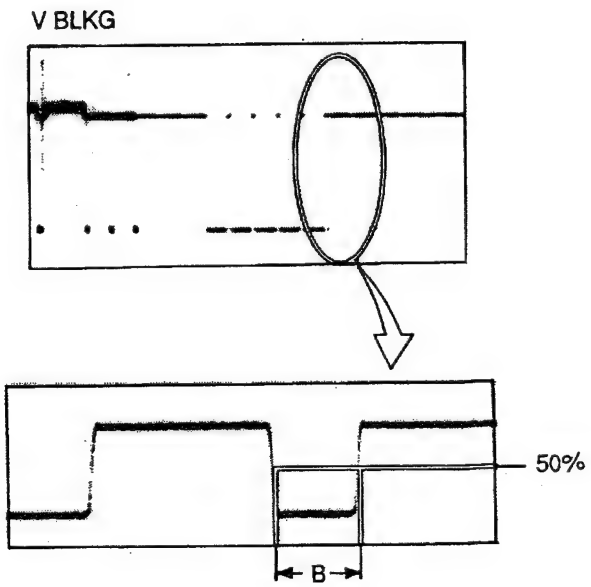
Lens iris:

Test point: TEST OUT terminal
Adjust point: RV1(SYNC WIDTH)/SG-143P board

Specification: A = 4.7 ± 0.1 µs
B = 2.3 ± 0.1 µs

Adjustment procedurs





Note:

STEP 2-3. SYNC phase adjustment

Note:

Equipment: Oscilloscope
To be extended: EN-69P board
Trigger:
Preparation
ENC/RGB switch (side panel) "ENC"

Object:

Monitor screen Waveform monitor

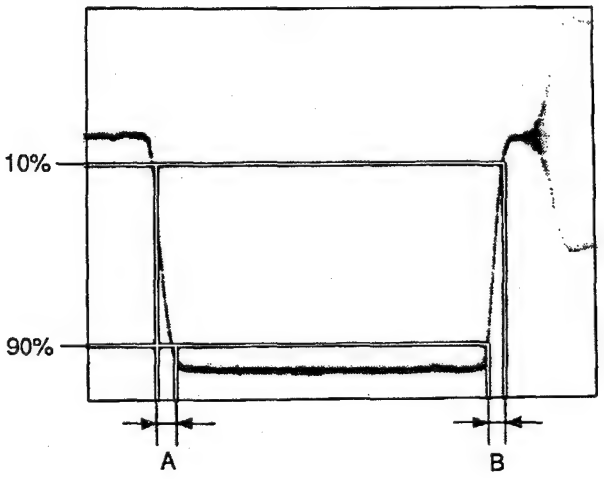
Lens Zoom:

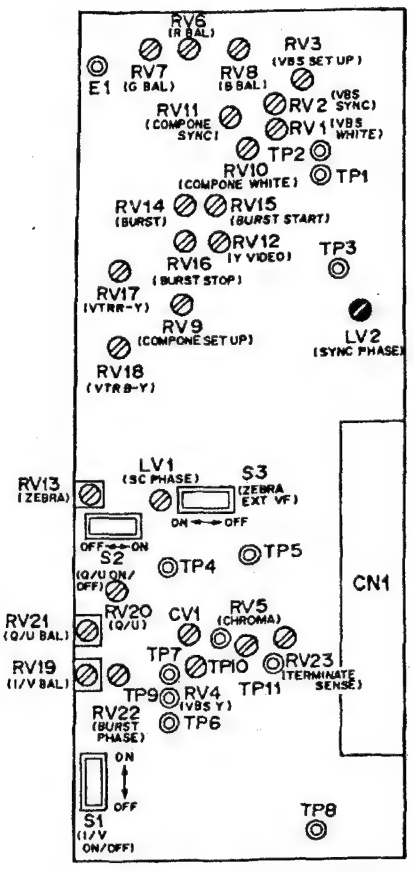
Lens iris:

Test point: TP9(GND:TP11)/extension board
Adjust point: ⊘ LV2 (SYNC PHASE)/EN-69P board

Specification: A = B = 0.25 ± 0.05 µs (Adjust so as to disappear the overshoot and undershoot.)

Adjustment procedurs





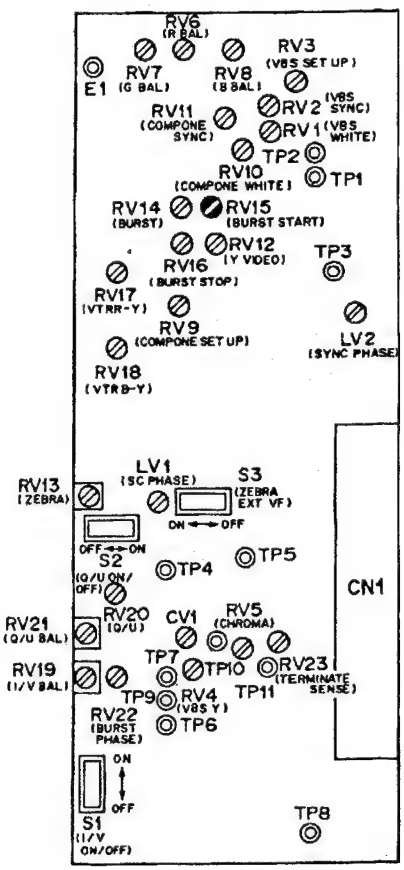
EN-69/69P BOARD (COMPONENT SIDE)

Note:

STEP 2-4. Burst flag adjustment

Note:

Equipment: Waveform monitor (WFM)
To be extended: EN-69P board
Trigger:
Preparation
ENC/RGB switch (side panel) "ENC"



EN-69/69P BOARD (COMPONENT SIDE)

Object:

Monitor screen	Waveform monitor

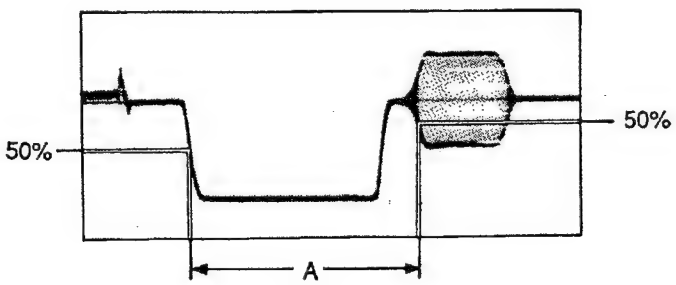
Lens Zoom:

Lens iris:

Test point: TEST OUT terminal
Adjust point: ◐ RV15(BURST START)/EN-69P board

Specification: A = 5.6 ± 0.1 µs

Adjustment procedurs

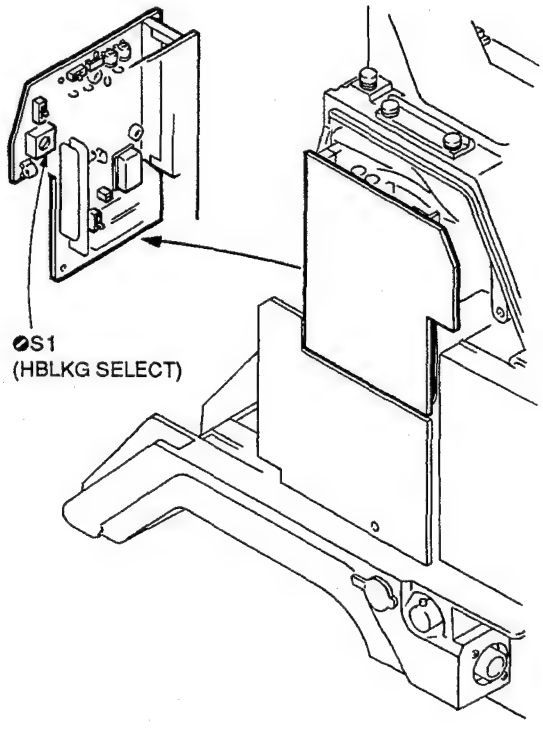


Note:

STEP 2-5. H BLKG width adjustment

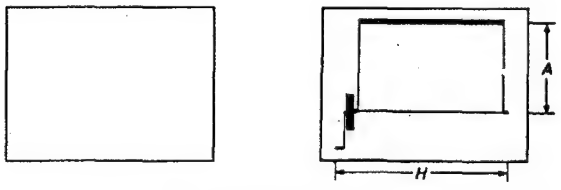
Note:

Equipment: Waveform monitor (WFM)
To be extended: SG-143P board
Trigger:
Preparation
1. When the pattern box is PTB-500, insert the filter unit.
2. ENC/RGB switch (side panel) "ENC"



Object: White window

Monitor screen Waveform monitor

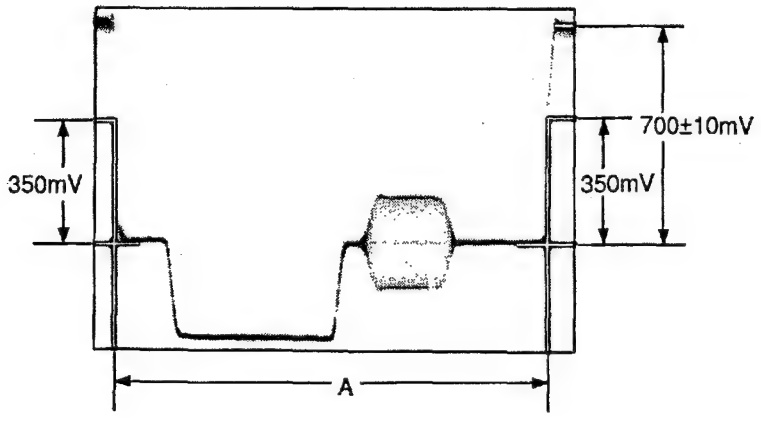


Lens Zoom: Underscanned picture frame on the monitor = Chart frame
Lens iris: A=700±10 mV (at TEST OUT terminal)

Test point: TEST OUT terminal
Adjust point: S1(H BLKG SELECT)/SG-143P board

Specification: A=12.05±0.25 µs

Adjustment procedurs

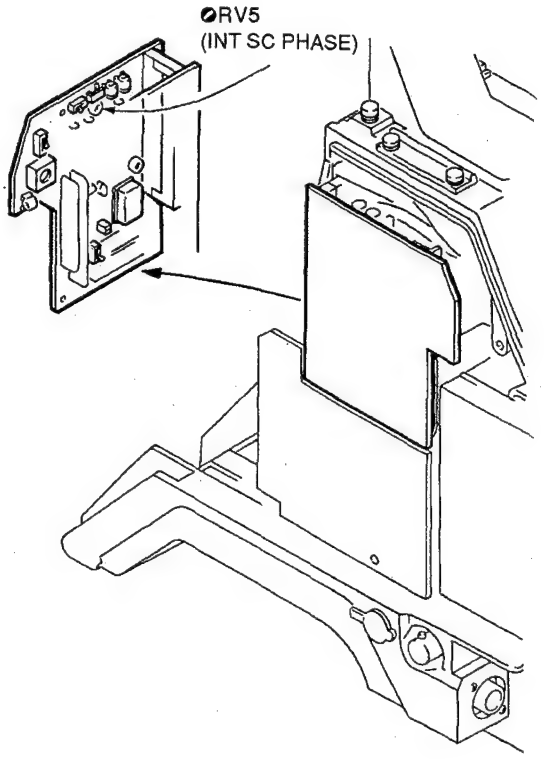


Note:

STEP 2-6. INT SC phase adjustment

Note: The procedure stated below applies to the adjustments where the Tektronix 1751 is used.
If any other measuring instrument is used, observe the instructions given in the operation manual attached to it.

Equipment: SC-H Phase measuring instrument
To be extended: SG-143P board
Trigger:
Preparation
1. Disconnect the vectorscope, and connect the Tektronix 1751 instead.
2. Put the Tektronix 1751 into the SC-H mode.



Object:

Monitor screen	Waveform monitor

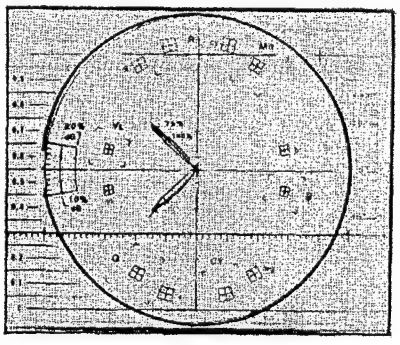
Lens Zoom:

Lens iris:

Test point: VIDEO OUT connector
Adjust point: RV5(INT SC PHASE)/SG-143P

Specification:

Adjustment procedures
Position the luminous line of the burst (SC) and the luminescent spot of H properly.



Note:

STEP 3. VIDEO SIGNAL SYSTEM

STEP 1. Power Supply System

STEP 2. Synchronizing Signal System

STEP 3-1. DC balance adjustment

STEP 3-2. VA Gain adjustment

STEP 3-3. Pre-Black set adjustment

STEP 3-4. VA Clip level adjustment

STEP 3-5. Test signal waveform adjustment

STEP 3-6. Pre Knee adjustment

STEP 3-7. Modulator Balance adjustment

STEP 3-8. Black Shading adjustment

STEP 3-9. White Shading adjustment

STEP 3-10. PR IN Gain adjustment

STEP 3-11. Pre-Pedestal level and PR OUT Gain adjustment

STEP 3-12. Gamma Balance adjustment

STEP 3-13. Flare DC Blance adjustment

STEP 3-14. Carrier Balance adjustment

STEP 3-15. Black-set and Pedestal adjustment

STEP 3-16. Flare adjustment

STEP 3-17. R,G,and B Video Level adjustment

STEP 3-18. EN Y Level adjutsment

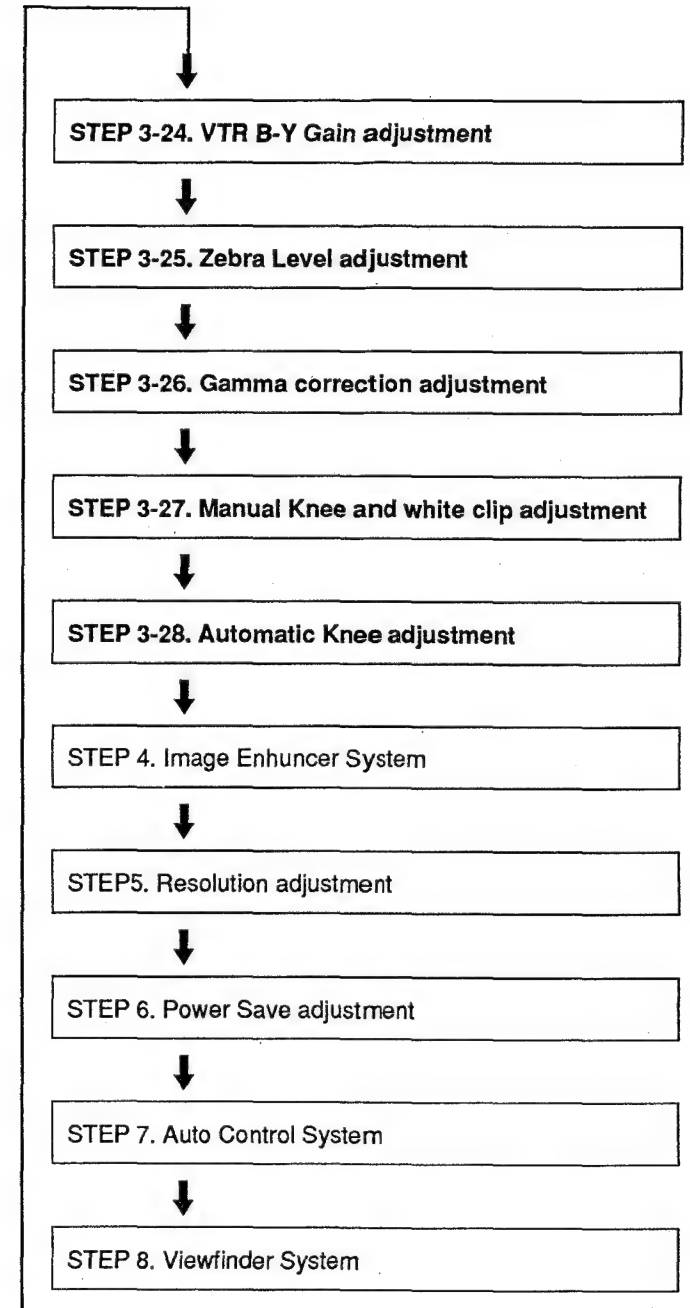
STEP 3-19. Color-bar adjustment

STEP 3-20. UV Gain adjustment

STEP 3-21. Burst adjustment

STEP 3-22. VTR Y Gain adjustment

STEP 3-23. VTR R-Y Gain adjustment


STEP 3-24. VTR B-Y Gain adjustment
STEP 3-25. Zebra Level adjustment
STEP 3-26. Gamma correction adjustment
STEP 3-27. Manual Knee and white clip adjustment
STEP 3-28. Automatic Knee adjustment
STEP 4. Image Enhuncer System
STEP5. Resolution adjustment
STEP 6. Power Save adjustment
STEP 7. Auto Control System
STEP 8. Viewfinder System

STEP 3-1. DC bias adjustment

Note: Carry out the STEP 3-1. DC bias adjustment to the STEP 3-4. VA Clip Level adjustment in order, or their adjustments will become invalid.

Equipment: Oscilloscope
To be extended: VA-85 board
Trigger:
Preparation

S2(TEST)/VA-85 board	"OFF"	⊘RV53(R CLIP)/VA-85 board	"fully clockwise"
⊘RV6(G GAIN)/VA-85 board	"fully clockwise"	⊘RV54(G CLIP)/VA-85 board	"fully clockwise"
⊘RV12(R GAIN)/VA-85 board	"fully clockwise"	⊘RV55(R CLIP)/VA-85 board	"fully clockwise"
⊘RV1(B GAIN)/VA-85 board	"fully clockwise"		

Object:

Monitor screen — Waveform monitor

Lens Zoom:

Lens iris: Close "C"

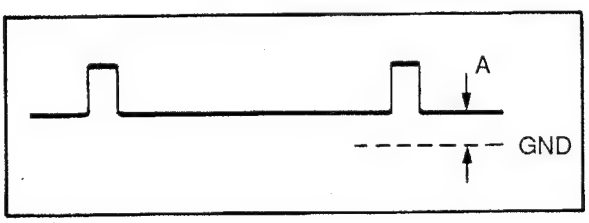
Test point: mentioned below
Adjust point: mentioned below

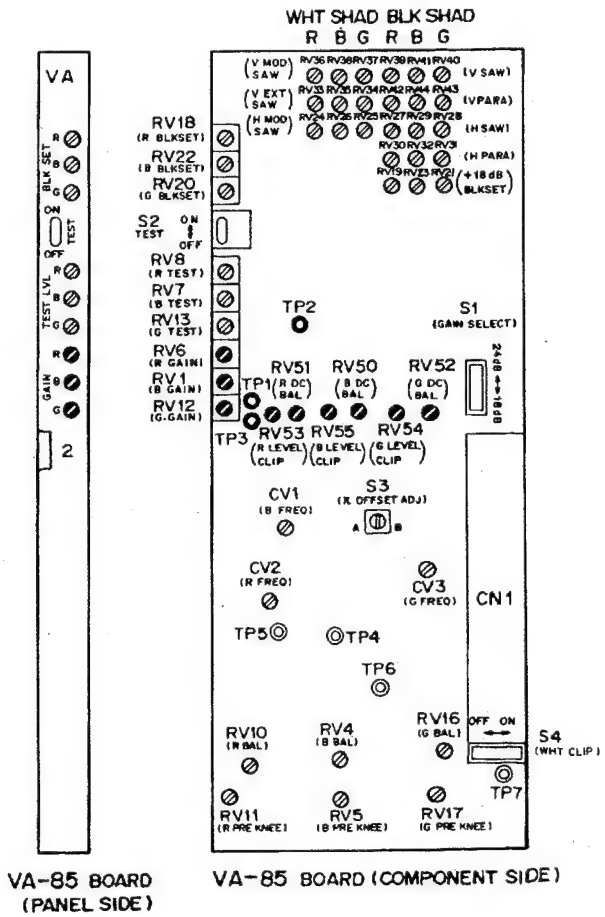
Specification: mentioned below

Adjustment procedures
Adjust every channel as stated above.

	Test point/ VA-85 board	Adjust point/ VA-85 board	Specification
G-ch	TP3	⊘ RV52	A=+0.69±0.05Vdc
R-ch	TP2	⊘ RV51	A=+0.69±0.05Vdc
B-ch	TP1	⊘ RV50	A=+1.2±0.1Vdc

(GND:GND on the extension board)





Note: After this adjustment is completed, be sure to carry out STEP 3-2. VA Gain adjustment.

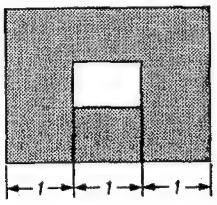
STEP 3-2. VA Gain adjustment

Note: 1. Use a white pattern chart for this adjustment. Adjust the lighting so that the white area is exactly 3200K of color temperature.
2. When the pattern box is used, well maintained pattern box should be used.

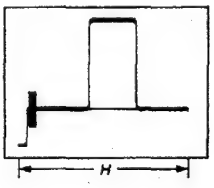
Equipment: Oscilloscope
To be extended: VA-85 board
Trigger: HD(TP25/extension board)
Preparation
⊘RV5(B PRE KNEE)/VA-85 board "fully counterclockwise"
⊘RV17(G PRE KNEE)/VA-85 board "fully counterclockwise"
⊘RV11(R PRE KNEE)/VA-85 board "fully counterclockwise"

Object: White window chart

Monitor screen

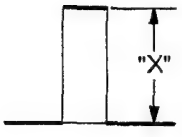


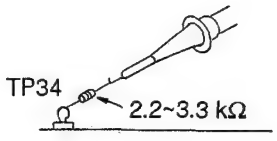
Waveform monitor



Lens Zoom: Underscanned picture frame on the monitor = chart frame

Lens iris: Adjust the iris control so that the white level "X" at TP34 (GND: TP33) on the extension board is as follows:
BVP-70P: "X"=0.25±0.03V
BVP-70ISP: "X"=0.275±0.03V



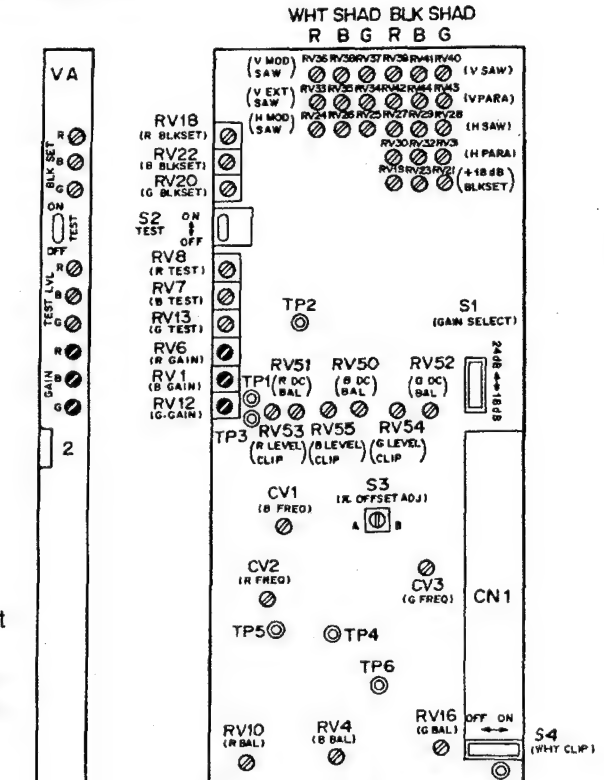


Note: When measuring the TP34, connect the resistance (2.2~3.3 kΩ) between the probe and the TP34.

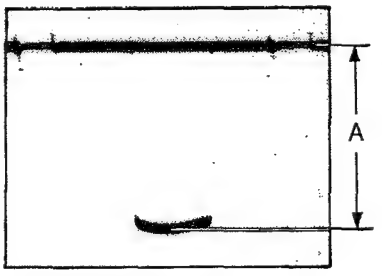
Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedures
Adjust every channel as stated above.



	Test point/ extension board	Adjust point/ VA-85 board	Specification
G-ch	TP9	⊘ RV12	A= 0.5 ± 0.01Vp-p
B-ch	TP5	⊘ RV1	
R-ch	TP7	⊘ RV6	



STEP 3-3. Pre-Black set adjustment

Note:

Equipment: Oscilloscope
To be extended: VA-85 board
Trigger: HD(TP25/extension board)
Preparation
S2 (TEST)/VA-85 board "OFF"
OUTPUT/DCC switch (side panel) "CAM/OFF"
GAIN switch (side panel) "0"

Object:

Monitor screen Waveform monitor

Lens Zoom:

Lens iris: Close "C"

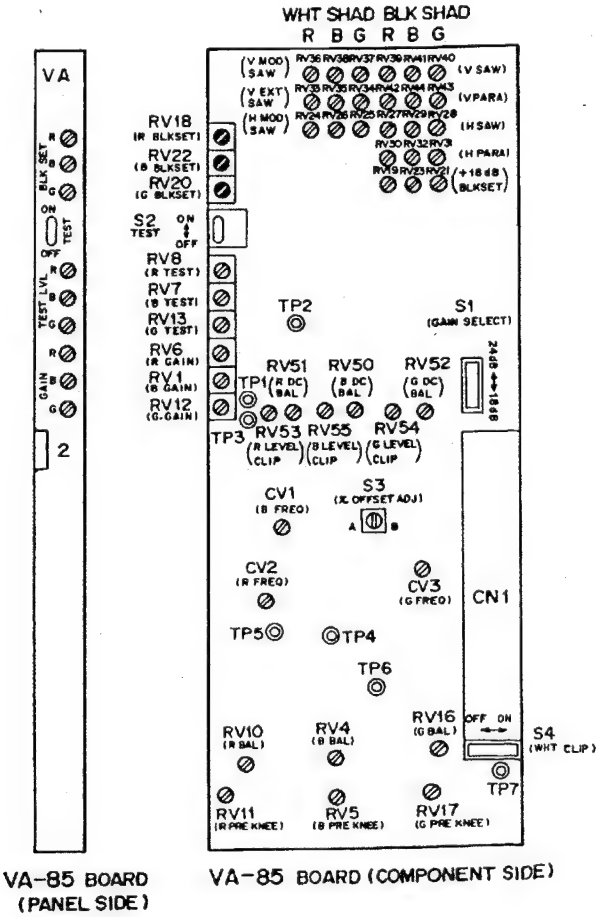
Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedures

	Test point/ extension board	Adjust point/ VA-85 board
G-ch	TP9	⊘ RV20
R-ch	TP7	⊘ RV18
B-ch	TP5	⊘ RV22

(GND:GND on the extension board)



Note:

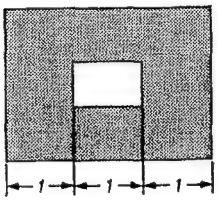
STEP 3-4. VA Clip Level adjustment

Note: Be sure to complete STEP 3-2. VA Gain adjustment.

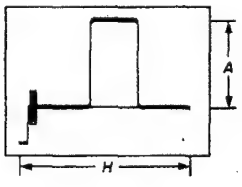
Equipment: Oscilloscope
To be extended: VA-85 board
Trigger: HD(TP25/extension board)
Preparation

Object: White window chart

Monitor screen



Waveform monitor



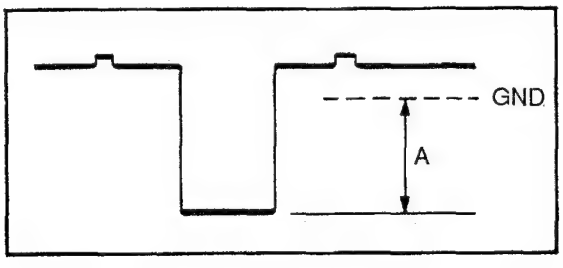
Lens Zoom: Shoot the white window chart as stated above.
Lens iris: Open

Test point: mentioned below
Adjust point: mentioned below

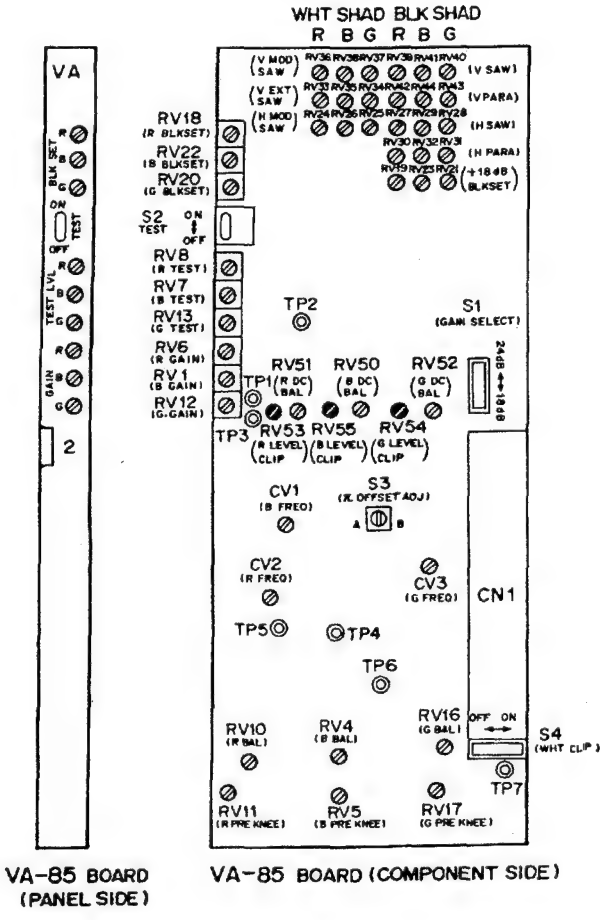
Specification: mentioned below

Adjustment procedures
Adjust every channel as shown below;

	Test point/ VA-85	Adjust point/ VA-85 board	Specification
G-ch	TP6	⊘ RV54	A= −3.6±0.05 Vdc
B-ch	TP4	⊘ RV55	
R-ch	TP5	⊘ RV53	



Note:



STEP 3-5. Test signal waveform adjustment

Note: Be sure to complete STEP 3-4. VA Clip Level adjustment.

Equipment: Oscilloscope
To be extended: VA-85 board
Trigger: HD(TP25/extension board)
Preparation
S2 (TEST)/VA-85 board "ON"
⊘RV5(B PRE KNEE)/VA-85 board "fully counterclockwise"
⊘RV17(G PRE KNEE)/VA-85 board "fully counterclockwise"
⊘RV11(R PRE KNEE)/VA-85 board "fully counterclockwise"

Object: Test signal

Monitor screen Waveform monitor

Lens Zoom:

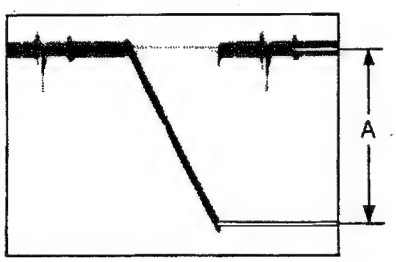
Lens iris:

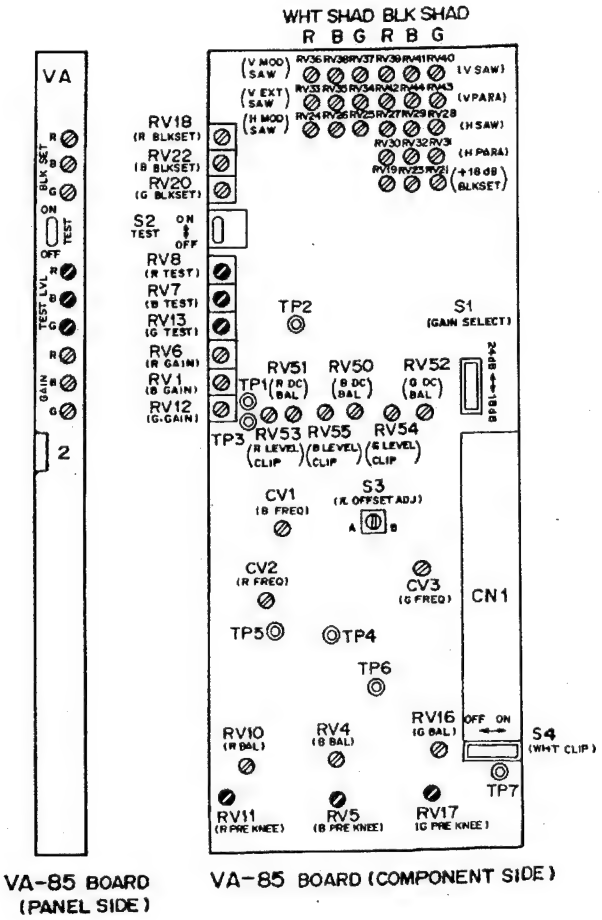
Test point mentioned below
Adjust point: mentioned below

Specifications: mentioned below

Adjustment procedures
Adjust every channel as stated above.

	Test point/ extension board	Adjust point/ VA-85 board	Specification
G-ch	TP9	⊘ RV13	A= 0.5 ± 0.01Vp-p
B-ch	TP5	⊘ RV7	
R-ch	TP7	⊘ RV8	





Note:

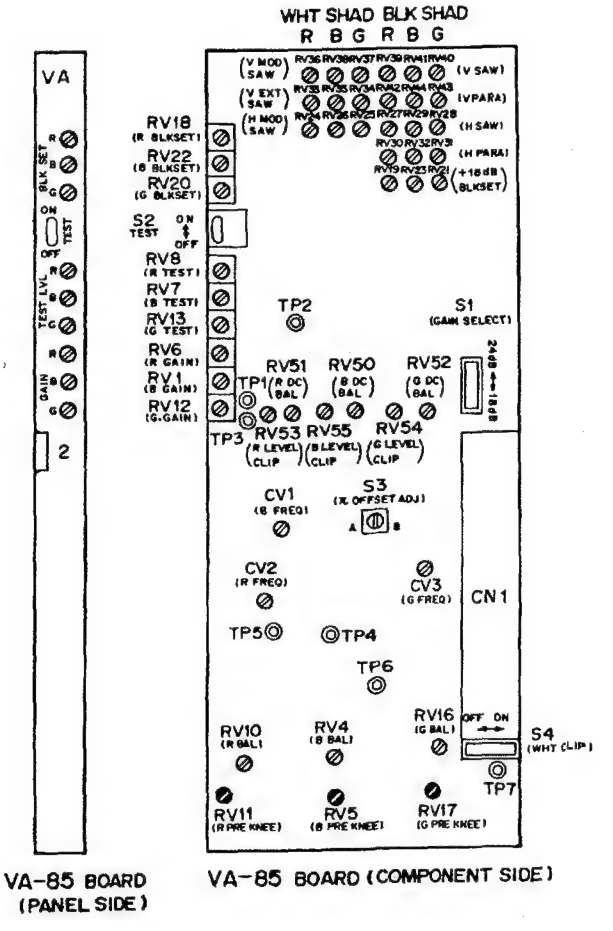
STEP 3-6. Pre Knee adjustment

Note:

Equipment: Oscilloscope
To be extended: VA-85 board
Trigger: HD (TP25/extension board)
Preparation
GAIN switch (side panel) "9dB"
S2 (TEST)/VA-85 board "ON"
S4 (CLIP)/VA-85 board "OFF"

Object: Test signal

Monitor screen Waveform monitor



Lens Zoom:

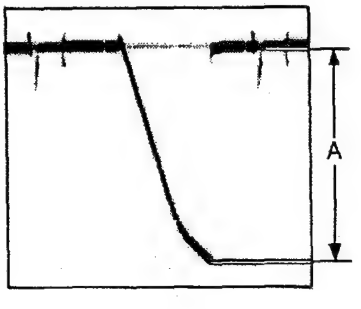
Lens iris:

Test point mentioned below
Adjust point: mentioned below

Specifications: mentioned below

Adjustment procedurs
- Adjust every channel as stated above.

	Test point/ extension board	Adjust point/ VA-85 board	Specification
G-ch	TP9	RV17	A= 1.15 ± 0.02Vp-p
B-ch	TP5	RV5	
R-ch	TP7	RV11	



Note: After this adjustment is completed, set the S4 (CLIP)/VA-85 board to "ON".

STEP 3-7. Modulator Balance adjustment

Note:

Equipment: Oscilloscope
To be extended: VA-85 board
Trigger: VD(TP26/extension board)
Preparation

Object:

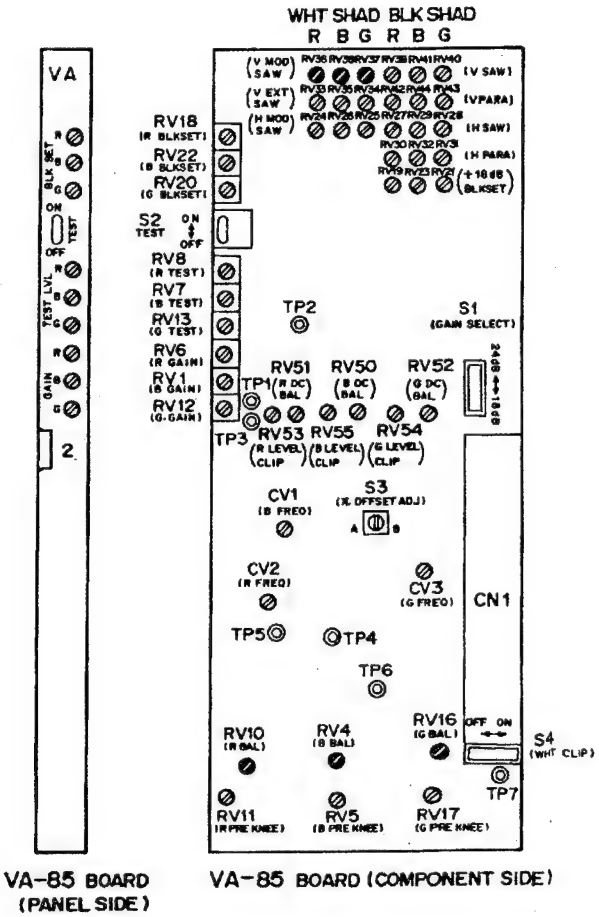
Monitor screen Waveform monitor

Lens Zoom:

Lens iris : Close "C"

Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

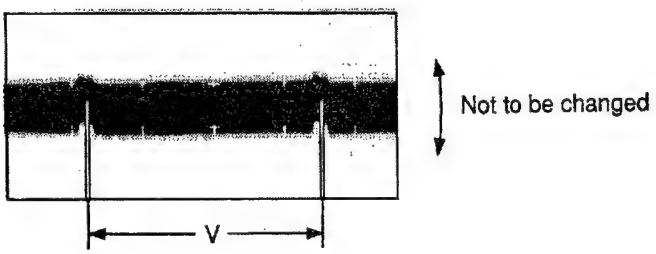


VA-85 BOARD (PANEL SIDE) VA-85 BOARD (COMPONENT SIDE)

Adjustment procedurs

• Adjust every channel as shown below;
Adjust the ⊘ "B" so that the waveform does not change even if ⊘ "A" is turned both clockwise and counterclockwise fully.

	Test point/ extension board	Adjust point/VA-85 board	
		A	B
G-ch	TP9	⊘ RV37	⊘ RV16
B-ch	TP5	⊘ RV38	⊘ RV4
R-ch	TP7	⊘ RV36	⊘ RV10



Note: After this adjustment is completed, carry out STEP 3-9. White shading adjustment.

STEP 3-8. Black Shading adjustment

Note:

Equipment: Waveform monitor (LUM mode)
To be extended: VA-85 board
Trigger:
Preparation
GAIN switch (side panel) "18dB"
ENC/RGB switch (side panel) "RGB"
S2(TEST)/VA-85 board "OFF"

Object:

Monitor screen Waveform monitor

Lens Zoom:

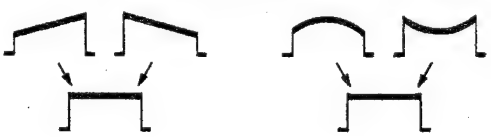
Lens iris : Close "C"

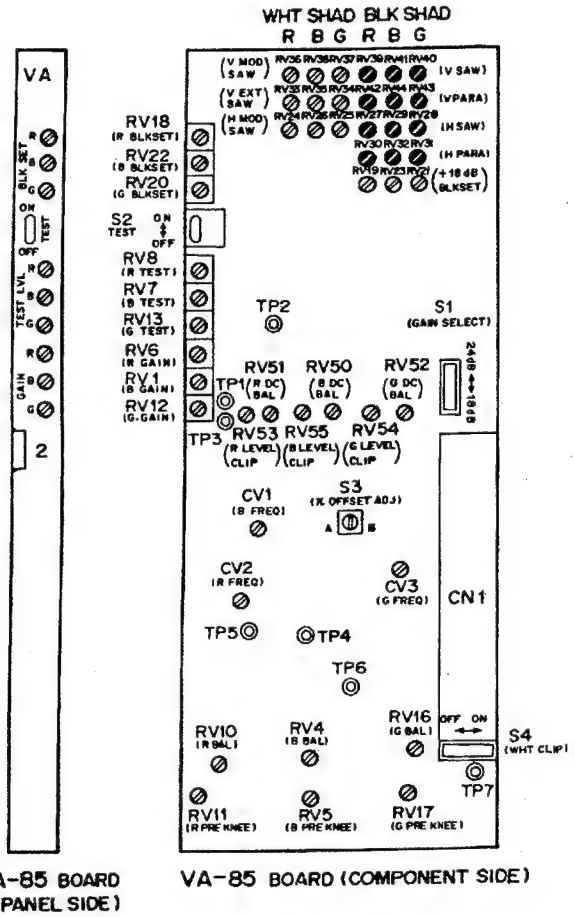
Test point: TEST OUT terminal
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedures
1. Adjust the PEDESTAL control (side panel) so that the pedestal level is approx. 70mV.
2. Set the LUM mode at the waveform monitor, and set the VOLT FULL SCALE range at 0.5.
3. Adjust the every adjusting point so that the waveform is flat.

	Switches setting (side panel)	Adjusting point/VA-85 board			
		H SAW	V SAW	H PARA	V PARA
G-ch	G/OFF "G" R/OFF/B "OFF"	RV28	RV40	RV31	RV43
R-ch	G/OFF "OFF" R/OFF/B "R"	RV27	RV39	RV30	RV42
B-ch	G/OFF "OFF" R/OFF/B "B"	RV29	RV41	RV32	RV44





Note: After this adjustment is completed, set the switches as follow;
- GAIN switch (side panel) "0"
- PEDESTAL control (side panel) "mechanical center"

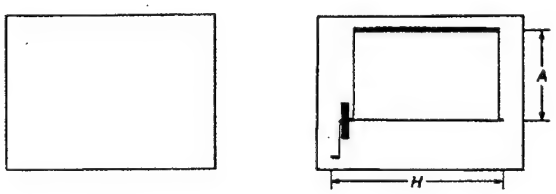
STEP 3-9. White Shading adjustment

Note: 1. Before this adjustment is performed, be sure to complete STEP 3-7. Modulator Balance adjustment.
2. When using the lens with the EXTENDER attached, carry out the V EXT SAW adjustment. Before this adjustment, set the EXT lever of lens at X2 position and adjust the iris control so that the video level at TEST OUT terminal is 700 10mV. After this adjustment is completed, set the EXT lever at X1 position.

Equipment: Waveform monitor(WFM)
To be extended: VA-85 board
Trigger:
Preparation
ENC/RGB switch (side panel) "RGB"
S4(WHT CLIP)/PR-134 board "OFF"

Object: White window

Monitor screen Waveform monitor

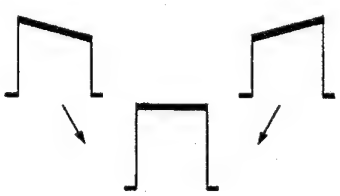


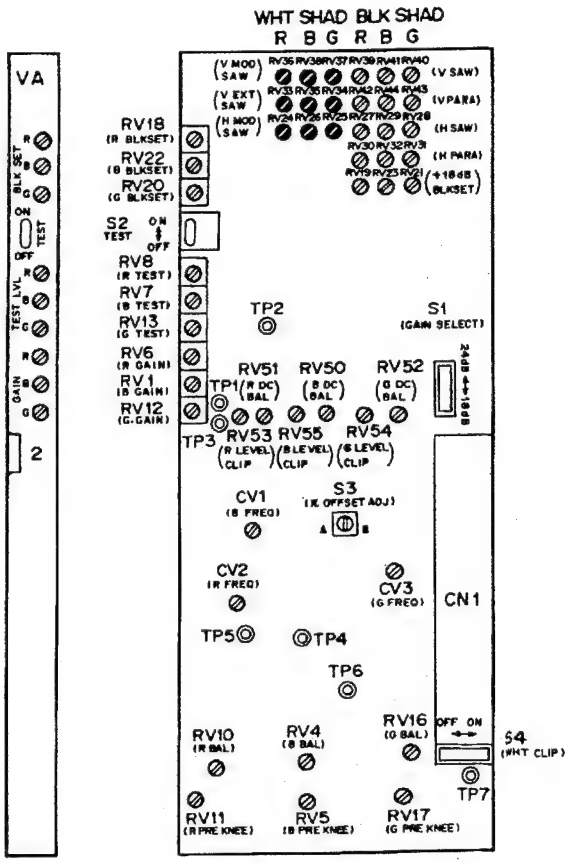
Lens Zoom: Set the zoom control at TELE and shoot the white area of white window chart.
Lens iris: A = 700 ± 10mV. (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedures
Adjust the every adjusting point so that the waveform is flat.

	Switches setting (side panel)	Adjust point/VA-85 board		
		H MOD SAW	V MOD SAW	V EXT SAW
G-ch	G/OFF "G" R/OFF/B "OFF"	⊘ RV25	⊘ RV37	⊘ RV34
R-ch	G/OFF "OFF" R/OFF/B "R"	⊘ RV24	⊘ RV36	⊘ RV33
B-ch	G/OFF "OFF" R/OFF/B "B"	⊘ RV26	⊘ RV38	⊘ RV35





VA-85 BOARD (PANEL SIDE) VA-85 BOARD (COMPONENT SIDE)

Note:

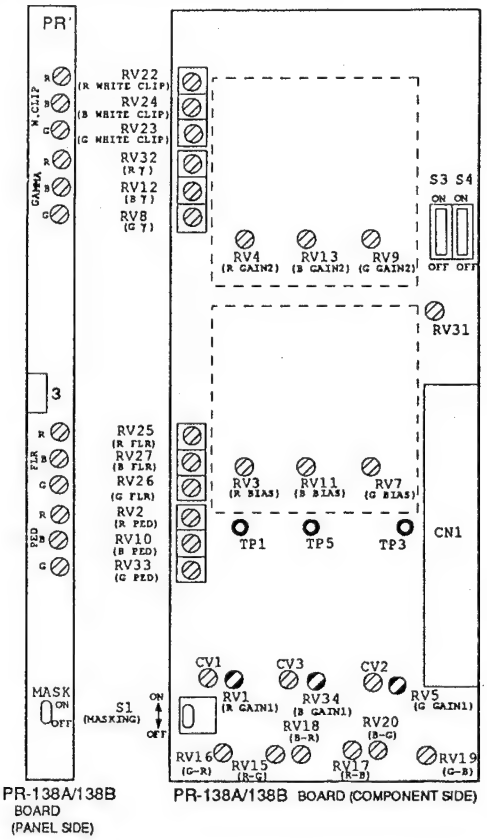
STEP 3-10. PR IN Gain adjustment

Note: Be sure to complete STEP 3-4. TEST wafeform signal level adjustment.
Remove the PR-139 board and PR-140 board on the PR-138A board. Their boards are connected by the board connectors.

Equipment: Oscilloscope
To be extended: PR-138A board
Trigger: CP(TP35/extension board)
Preparation
OUTPUT/DCC switch (side panel) "CAM/OFF"
GAIN switch (side panel) "0dB"
S2(TEST)/VA-85 board "ON"

Object: Test signal

Monitor screen Waveform monitor



Lens Zoom:

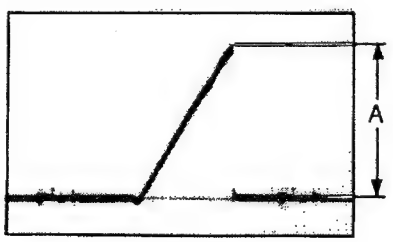
Lens iris:

Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedurs
Adjust every channel as shown below.

	Test point/ PR-138A board	Adjust point/ PR-138A board	Specification
G-ch	TP3	⊘ RV5	A= 2.0 ± 0.1Vp-p
B-ch	TP5	⊘ RV34	
R-ch	TP1	⊘ RV1	



Note:

STEP 3-11. Pre-Pedestal level and PR OUT Gain adjustment

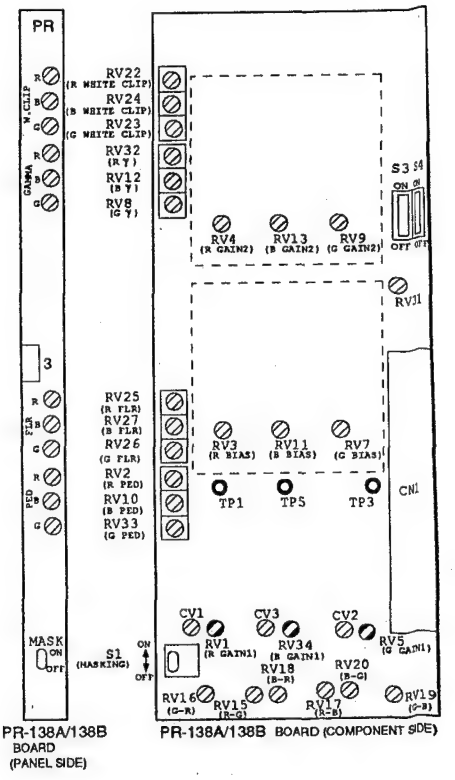
Note:

Equipment: Oscilloscope,Wavefrom monitor
To be extended: PR-138A
Trigger: CP(TP35/extension board)

Preparation: S2(TEST)/VA-85 board "ON"
S4(WHT CLIP)/PR-138A board "OFF"

Object: Test signal

Monitor screen Waveform monitor



Lens Zoom:

Lens iris:

Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

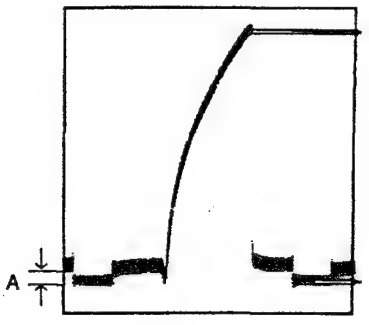
Adjustment procedures:
Adjust every channel as shown below.

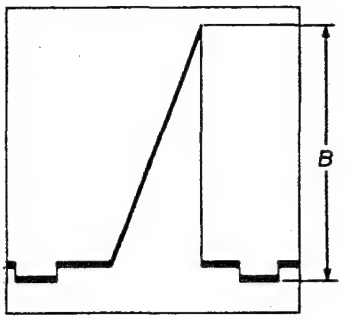
1. Pre-pedestal level adjustment
Preparation: S3(γ ON/OFF)/PR-138A board "ON"

	Test point/ extension board	Adjust point/ PR-138A board	Specification
G-ch	TP17	RV33	A= 20 ± 2 mVp-p
B-ch	TP16	RV10	
R-ch	TP18	RV2	

2. PR OUT Gain adjustment
Preparation: S3(γ ON/OFF)/PR-138A board "OFF"

	Test point/ extension board	Adjust point/ PR-138A board	Specification
G-ch	TP17	RV9	B= 700 ± 7 mVp-p
B-ch	TP16	RV13	
R-ch	TP18	RV4	





STEP 3-12. Gamma Balance adjustment

Note:

Equipment: Oscilloscope
To be extended: PR-138A board
Trigger: CP(TP35/extension board)
Preparation
S2(TEST)/VA-85 board "ON"
S4(WHT CLIP)/PR-138A board "OFF"

Object: Test signal

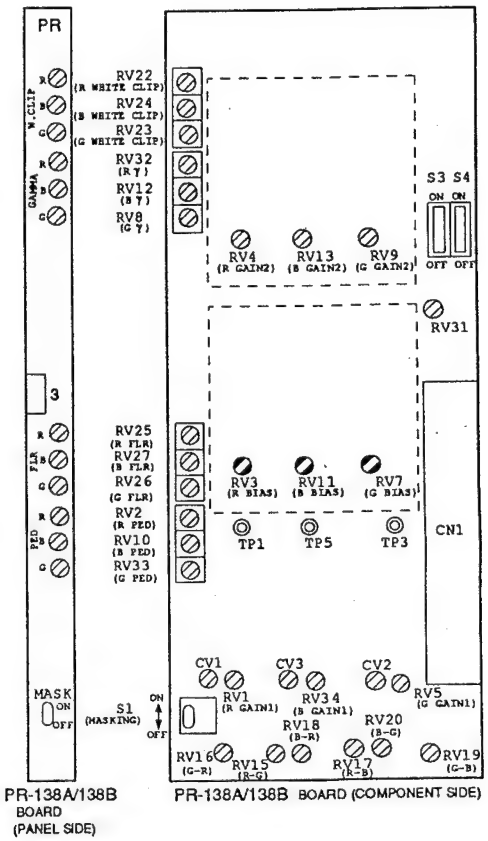
Monitor screen Waveform monitor

Lens Zoom:

Lens iris:

Test point: mentioned below
Adjust point: mentioned below

Specifications: mentioned below

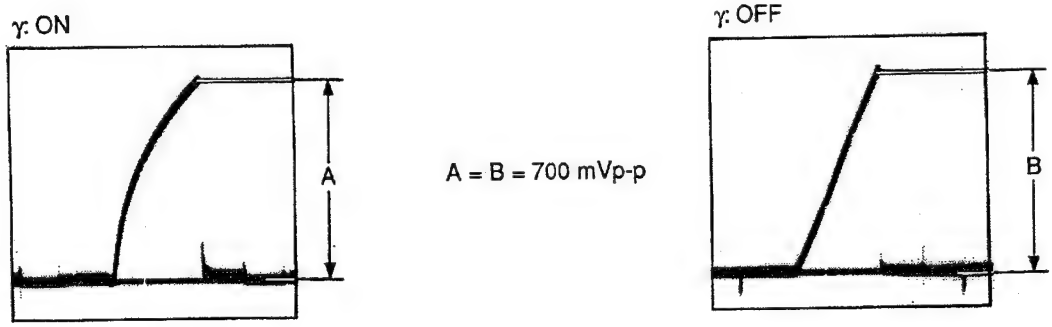


Adjustment procedures

- Carry out G-channel, B-channel and R-channel adjustment as shown below.

The peak level of waveform does not change even if the S3(γ ON/OFF)/PR-138A board is set to ON or OFF.

	Test point/ extension board	Adjust point/ PR-138A board
G-ch	TP17	RV7
B-ch	TP16	RV11
R-ch	TP18	RV3



Note: After this adjustment is completed, be sure to carry out STEP3-10, again.
After STEP3-10, STEP3-11 are completed, attach the PR-139 board and PR-140 board on the PR-138A board.

STEP 3-13. Flare DC Balance adjustment

Note:

Equipment: Oscilloscope
To be extended: PR-138A board
Trigger: CP(TP35/extension board)
Preparation
S2 (TEST)/VA-85 board "OFF"
S3 (γ ON/OFF)/PR-138A board "ON"

Object:

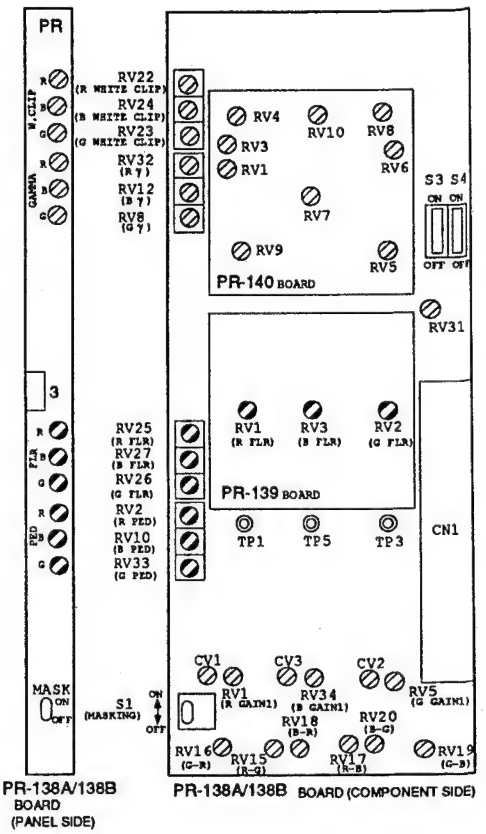
Monitor screen Waveform monitor

Lens Zoom:

Lens iris: Close "C"

Test point: mentioned below
Adjust point: mentioned below

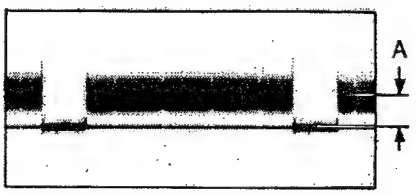
Specification: mentioned below



Adjustment procedures

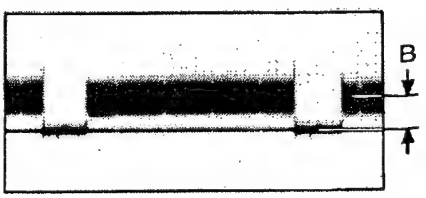
1. ⊘ RV25 (R FLR)/PR-138A board → fully clockwise
   ⊘ RV26 (G FLR)/PR-138A board → fully clockwise
   ⊘ RV27 (B FLR)/PR-138A board → fully clockwise
2. Carry out, G-channel, R-channel and B-channel adjustment as shown below.

	Test point/ extension board	Adjust point/ PR-138A board	Specification
G-ch	TP17	⊘ RV33	A = 50 ± 5 mV
B-ch	TP16	⊘ RV10	
R-ch	TP18	⊘ RV2	



3. ⊘ RV25 (R FLR)/PR-138A board→ fully counterclockwise
   ⊘ RV26 (G FLR)/PR-138A board→ fully counterclockwise
   ⊘ RV27 (B FLR)/PR-138A board → fully counterclockwise
4. Carry out, G-channel, R-channel and B-channel adjustment as shown below.

	Test point/ extension board	Adjust point/ PR-139 board	Specification
G-ch	TP17	⊘ RV2	A = 50 ± 5 mV
B-ch	TP16	⊘ RV3	
R-ch	TP18	⊘ RV1	



Note: After this adjustment is completed, set the switches as follow.
- OUTPUT/DCC switch (side panel) "CAM/OFF"
- S4 (WHT CLIP)switch/PR-138A board "ON"
- S3 (γ ON/OFF)switch/PR-138A board "OFF"
- S2 (TEST)switch/VA-85 board "ON"

STEP 3-14. Carrier Balance adjustment

Note:

Equipment: Vectorscope (MAX Gain)
To be extended: EN-69P board
Trigger:
Preparation
OUTPUT/DCC switch (side panel) "BARS/OFF"
ENC/RGB switch (side panel) "ENC"

Object:

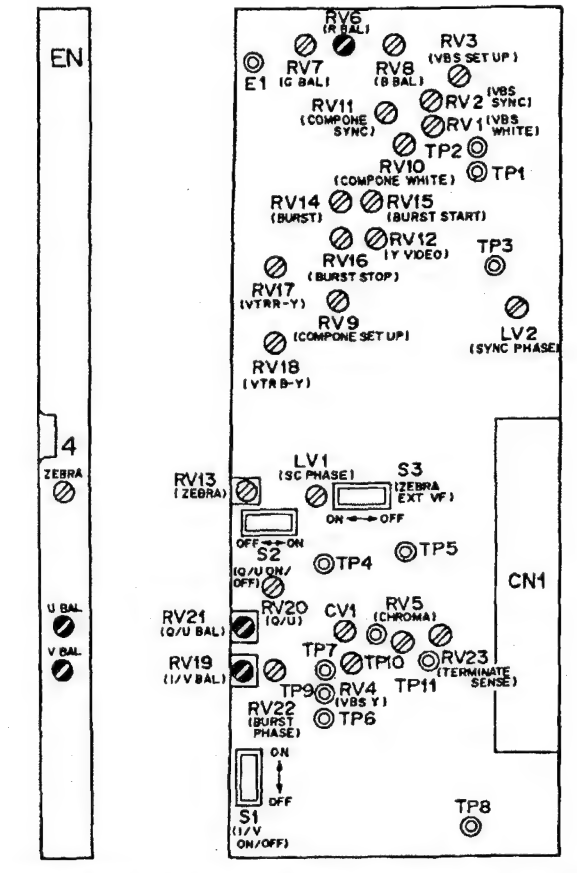
Monitor screen Waveform monitor

Lens Zoom:

Lens iris: Close "C"

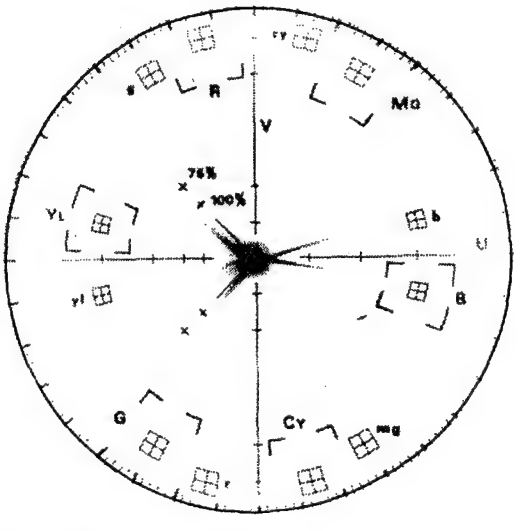
Test point: Vectorscope
Adjust point: ⊘ RV19 (V BAL)/EN-69P board
⊘ RV21 (U BAL)/EN-69P board
Specification: mentioned below

Adjustment procedurs
Adjust ⊘ RV19 (V BAL) and ⊘ RV21 (U BAL)/EN-69P board so as to center the black beam spot on the vectorscope.



EN-69P BOARD (PANEL SIDE)

EN-69/69P BOARD (COMPONENT SIDE)



Note: When black spots cannot be discriminated due to several beam spots, turn the ⊘RV6/EN-69P board. The black beam spots cannot be shifted. In this case, after adjustment is completed, perform STEP 3-19. Color-bar adjustment.

STEP 3-15. Black-set and Pedestal adjustment

Note: Be sure to reset the compensation data in the microprocessor, or this adjustment will become invalid.(See 4-1-3.Precaution on adjustments)

Equipment: Waveform monitor,Vectorscope (MAX Gain)
To be extended: VA-85 board
Trigger:
Preparation

ENC/RGB switch (side panel)	"RGB"
G/OFF switch (side panel)	"G"
R/OFF/B switch (side panel)	"OFF"

Object:

Monitor screen	Waveform monitor

Lens Zoom:

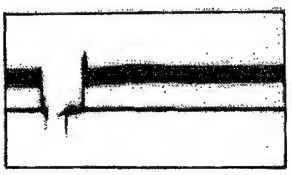
Lens iris: "C"

Test point: TEST OUT terminal
Adjust point: mentioned below

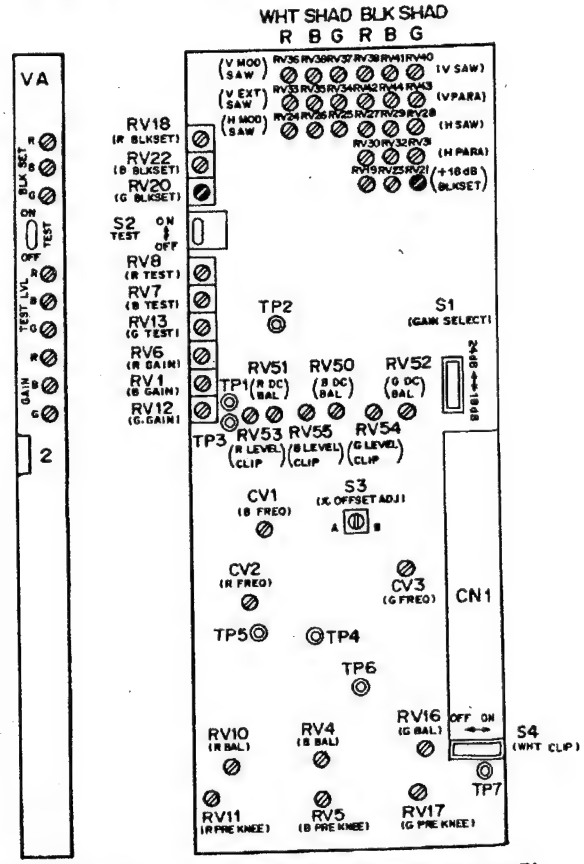
Specification: mentioned below

Adjustment procedurs

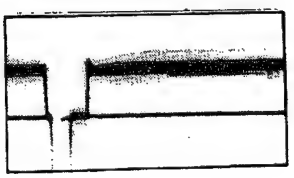
1. Adjust the PEDESTAL control (side panel) so that the pedestal level is approx. 70 mV.
2. Adjust the ⊘ RV20(G BLK SET)/VA-85 board so that the pedestal level does not change even if the GAIN selector is set to "0" or "9".



Not to be changed



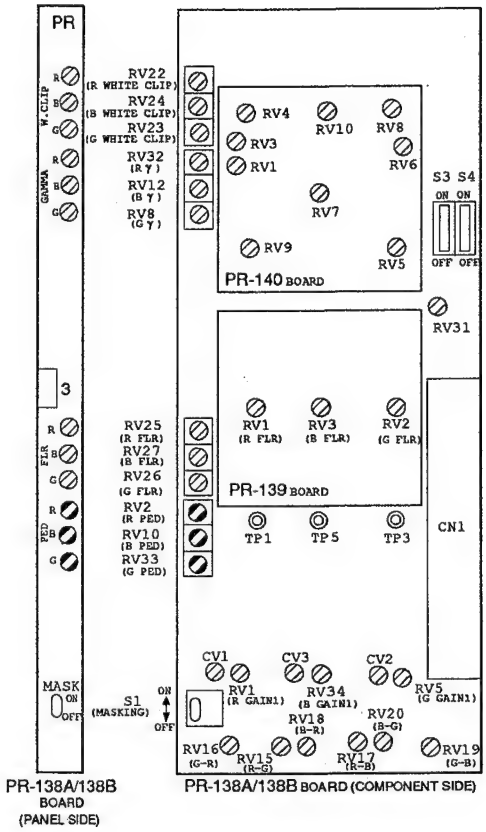
3. Adjust the ⊘ RV21(+18dB BLK SET)/VA-85 board so that the pedestal level does not change even if the GAIN selector is set to "0" or "18".



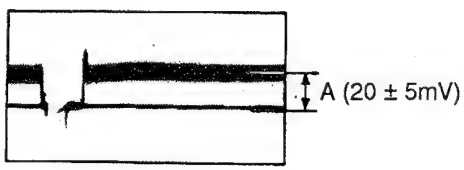
Not to be changed

4. Set the PEDESTAL control (side panel) to "mechanical center"

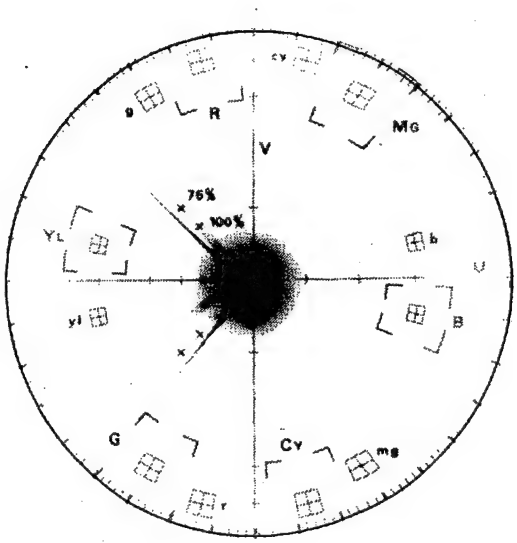
Note:

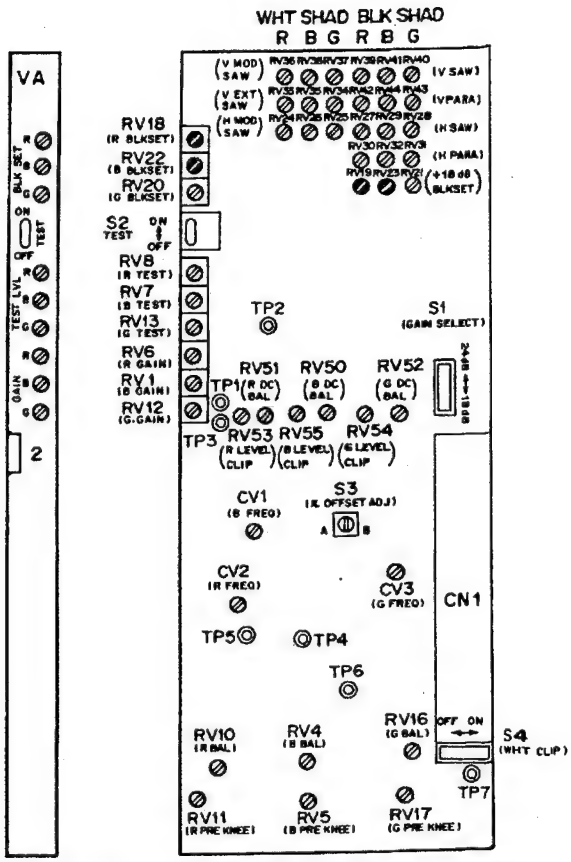


5. • To be extended : PR-138A board
   • Adjust the ◐ RV33 (GPED)/PR-138A board so that the DC level "A" at TEST OUT terminal is 20±5 mVdc.

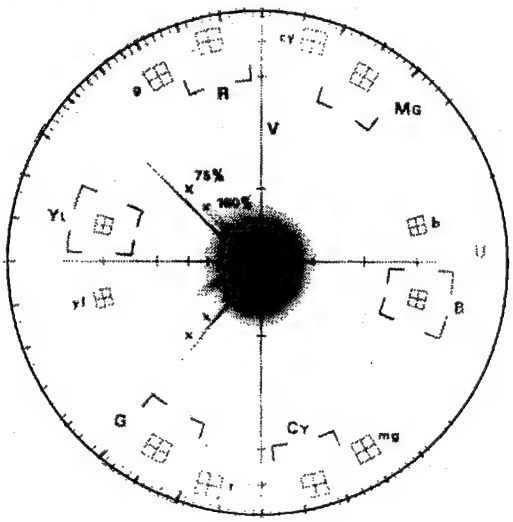


6. ENC/RGB switch (side panel) "ENC"
7. Adjust the ◐ RV2 and ◐ RV10 on the PR-138A board so that the beam spot should be positioned in the center of the vectorscope screen.

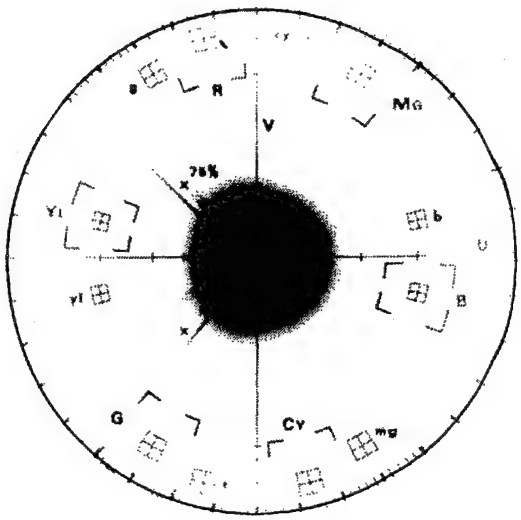




8. GAIN selector "9"
9. • To be extended : VA-85 board
   • Adjust the ⊘RV18 and ⊘RV22 on the VA-85 board so that the beam spot should be positioned in the center of the vectorscope screen.



10. GAIN selector (side panel) "18"
11. Adjust the ⊘ RV19 and ⊘ RV23 on the VA-85 board so that beam spot should be positioned in the center of the vectorscope screen.



12. Repeat item 7 to 11 so as to center the beam spot on the vectorscope,even if the GAIN selector (side panel) is set to "0","9" or "18".

Note: After this adjustment is completed, set the GAIN selector(side panel)to "0".

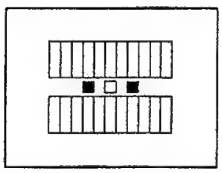
STEP 3-16. Flare adjustment

Note: Repeat carrying out this adjustment after STEP 3-15 Black set and Pedestal adjustment is carried out three or four times.

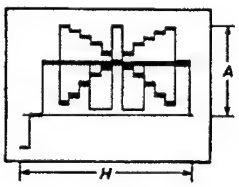
Equipment: Waveform monitor(WFM)
To be extended: PR-138A board
Trigger:
Preparation
ENC/RGB switch (side panel) "ENC"
⊘ RV26 (G FLR)/PR-138A board → fully counterclockwise
As shown below, stick non-reflective and nonphoto conductive cloth (such as velvet)as a reference of the black level.

Object: Gray scale chart

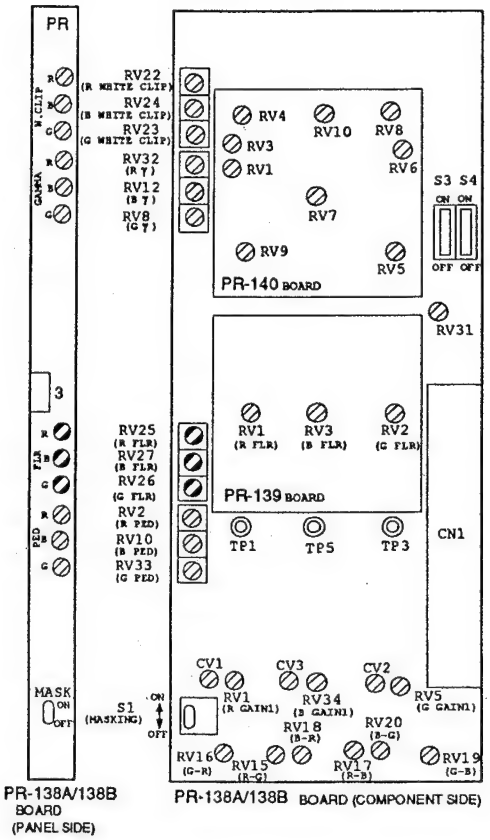
Monitor screen



Waveform monitor

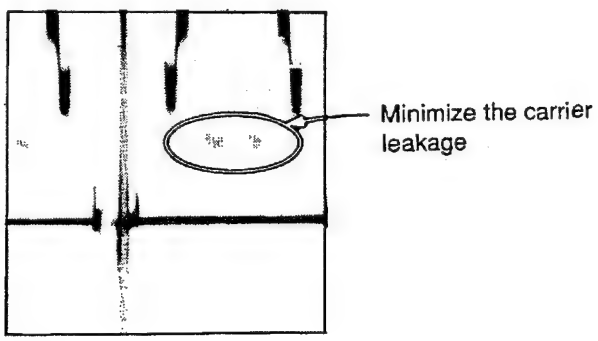


Lens Zoom: Underscanned picture frame on the monitor screen = chart frame
Lens iris: A = 700 ± 10mV. (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘ RV25 (R FLR)/PR-138A board
⊘ RV27 (B FLR)/PR-138A board
Specification: mentioned below



Adjustment procedures

1. Open the iris control 1 more than stop F value as stated above.
2. Adjust the ⊘ RV25 and ⊘ RV27 on the PR-138A board so that the carrier leakage of black level should be minimized.



Note:

STEP 3-17. RGB Video Level adjustment

Note:

Equipment: Waveform monitor(WFM)
To be extended:
Trigger:
Preparation

ENC/RGB switch (side panel)	"RGB"
G/OFF switch (side panel)	"G"
R/OFF/B switch (side panel)	"OFF"
S2 (TEST)/VA-85 board	"ON"
S4 (WHT CLIP)/PR-138A board	"OFF"

Object: Test signal

Monitor screen Waveform monitor

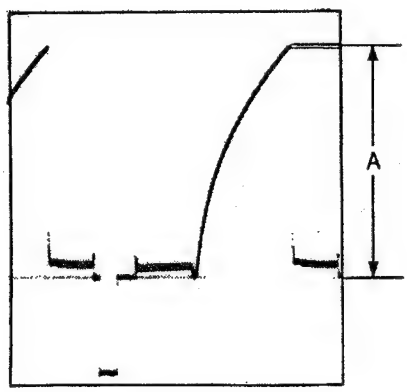
Lens Zoom:

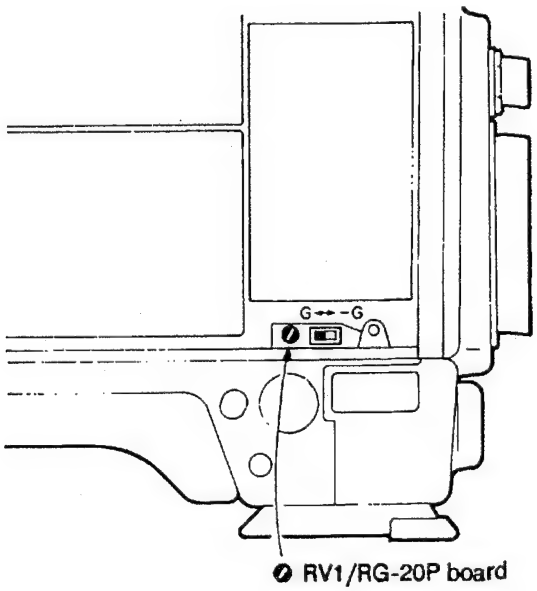
Lens iris:

Test point: TEST OUT terminal
Adjust point: ⊘ RV1/RG-20 board

Specification: A = 700 ± 10mV

Adjustment procedurs





Note: After this adjustment is completed, set the S2 (TEST)/VA-85 board to "OFF" and S4 (WHT CLIP)/PR-138A board to "ON".

STEP 3-18. EN Y Level adjutsment

Note:

Equipment: Waveform monitor
To be extended: EN-69P board
Trigger:
Preparation

ENC/RGB switch (side panel)	"ENC"
S2 (TEST)/VA-85 board	"ON"
S4 (WHT CLIP)/PR-138A board	"OFF"

Object: Test signal

Monitor screen Waveform monitor

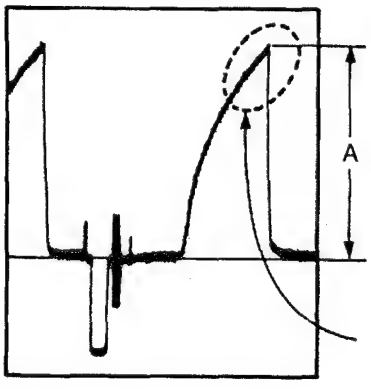
Lens Zoom:

Lens iris:

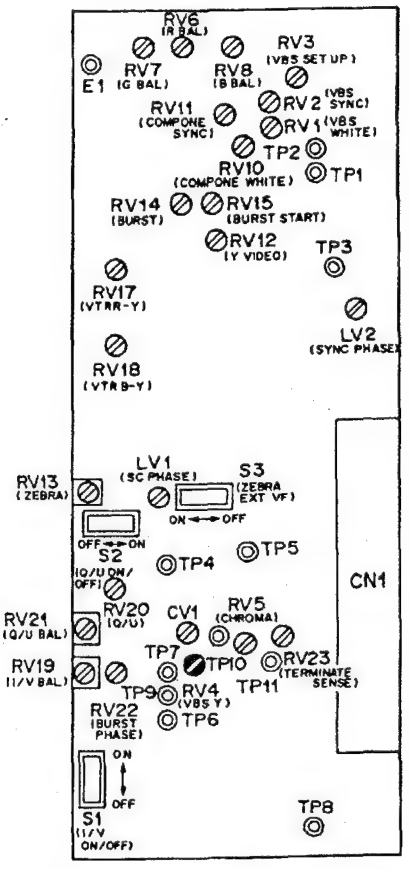
Test point: TEST OUT terminal
Adjust point: ⊘ RV4/EN-69P board

Specification: A = 700 ± 10mV

Adjustment procedures
Adjust the ⊘ RV4/EN-69P board repeatly so that the test signal level "A" is 700 ±10 mV.



Adjust ⊘ RV4 and ⊘ RV13/PR138A repeatedly so that the carrier leakage is minimum.



EN-69P BOARD (COMPONENT SIDE)

Note: After this adjustment is completed, set the switches as follow.

- S2 (TEST)/VA-85 board "OFF"
- S4 (WHT CLIP)/PR-138A board "ON"
- OUTPUT/DCC switch (side panel) "ON"

STEP 3-19. Color-bar adjutsment

Note:

Equipment: Waveform monitor (WFM)
To be extended: EN-69P board
Trigger:
Preparation
OUTPUT/DCC switch (side panel) "BARS/OFF"
ENC/RGB switch (side panel) "ENC"

Object: Color-bar signal

Monitor screen Waveform monitor

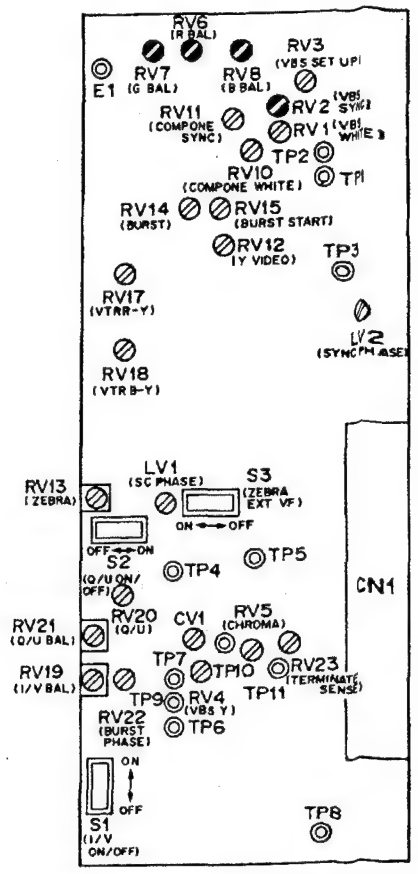
Lens Zoom:

Lens iris:

Test point: TEST OUT terminal
Adjust point: ⊘ RV7/EN-69P board
⊘ RV6/EN-69P board
⊘ RV8/EN-69P board
⊘ RV2/EN-69P board
Specification: A = 700 ± 10mV
B = 300 ± 10mV

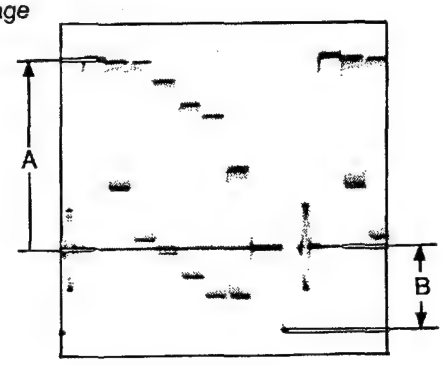
Adjustment procedures

1. Adjust the ⊘ RV7, ⊘ RV6 and ⊘ RV8/EN-69P board so that the white level"A"at TEST OUT terminal is 700 ± 10mV and the carrier leakage is minimized.
2. Adjust the ⊘ RV2/EN-69P board so that the SYNC level "B" is 300 ± 10mV.



EN-69P BOARD (COMPONENT SIDE)

Minimize the carrier leakage



Note:

STEP 3-20. UV Gain adjustment

Note:

Equipment: Vectorscope
To be extended: EN-69P board
Trigger:
Preparation
OUTPUT/DCC switch (side panel) "BARS/OFF"
S1 (V)/EN-69P board "ON"
S2 (U)/EN-69P board "OFF"

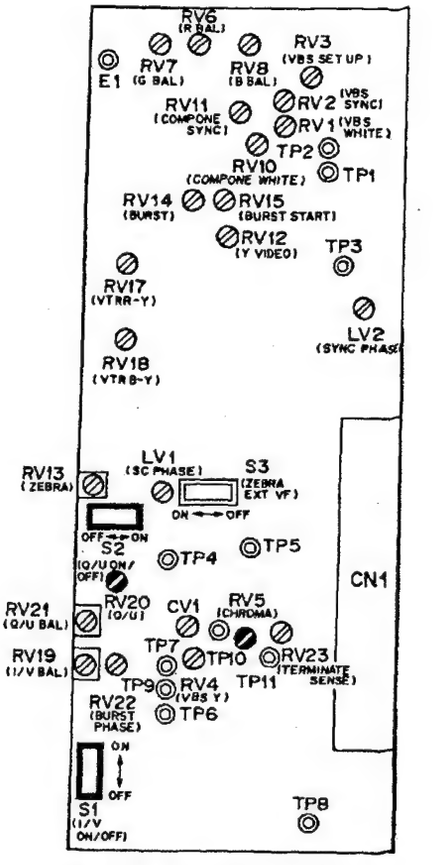
Object : Color-bar signal

Monitor screen Waveform monitor

Lens Zoom:

Lens iris:

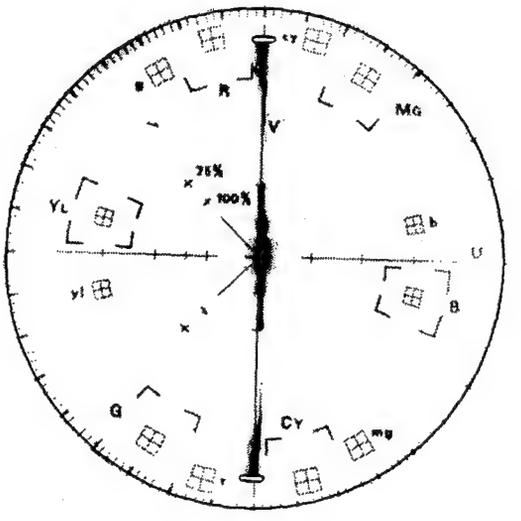
Test point : TEST OUT terminal
Adjust point : ⊘ RV5/EN-69P board
⊘ RV20/EN-69P board
Specification:



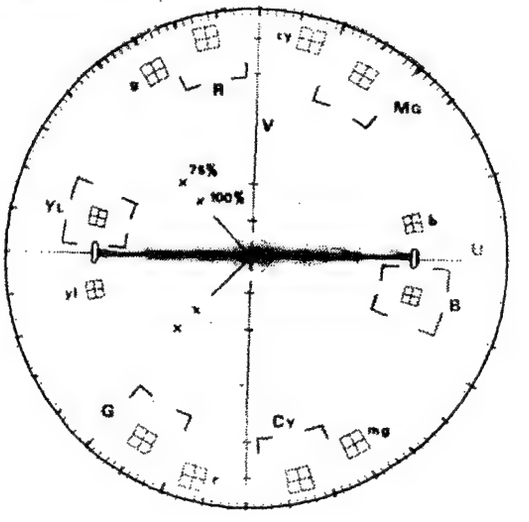
EN-69P BOARD (COMPONENT SIDE)

Adjustment procedurs

1. Adjust the PHASE control of the vectorscope so that the V signal is overlapped with V axis on the vectorscope screen.
2. Adjust ⊘ RV5/EN-69P board so that the beam spots at both ends of the V signal should be positioned on the specified point of the V axis.



3. S1 (V)/EN-69P board "OFF"
   S2 (U)/EN-69P board "ON"
4. Adjust the PHASE control of the vectorscope so that the U signal is overlapped with the U axis on the vectorscope screen.
5. Adjust ⊘ RV20/EN-69P board so that the beam spots at both ends of the U signal should be positioned on the specified point on the U axis.



Note:

STEP 3-21. Burst adjustment

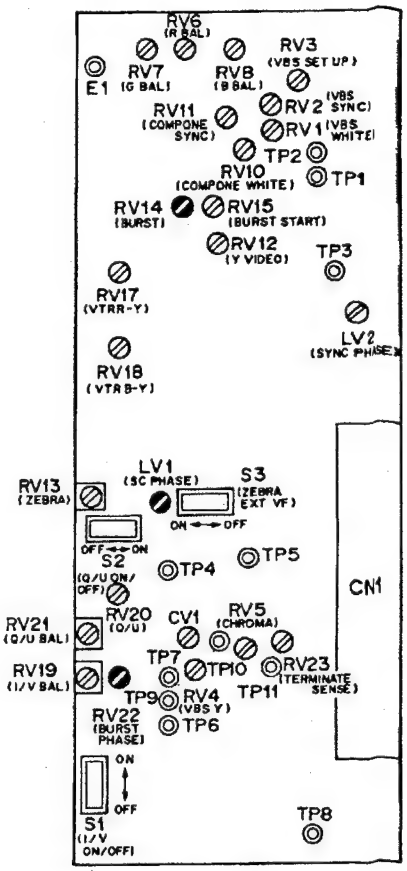
Note:

Equipment: Vectorscope
To be extended: EN-69P board
Trigger:
Preparation

OUTPUT/DCC switch (side panel)	"BARS/OFF"
S1 (V)/EN-69P board	"ON"
S2 (U)/EN-69P board	"ON"

Object: Color-bar signal

Monitor screen Waveform monitor



EN-69P BOARD (COMPONENT SIDE)

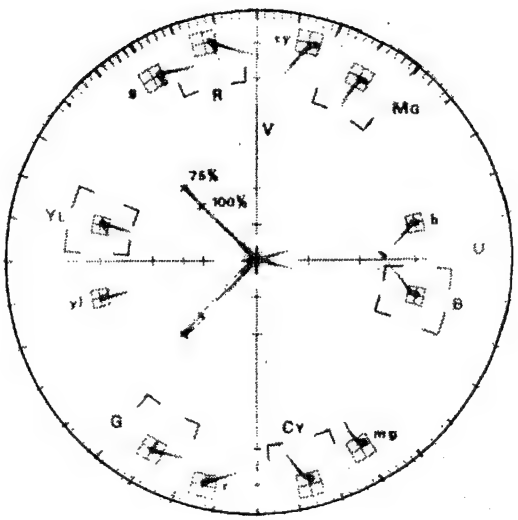
Lens Zoom:

Lens iris:

Test point: TEST OUT terminal
Adjust point: ⊘ RV14(BURST)/EN-69P board
⊘ RV22(BURST PHASE)/EN-69P board
⊘ LV1(SC PHASE)/EN-69P board
Specification:

Adjustment procedurs

1. Adjust the PHASE control of the vectorscope so that the burst spot is overlapped with 75% scale on the vectorscope.
2. Adjust the PHASE control of the vectorscope, ⊘RV14 (BURST), ⊘RV22 (BURST PHASE) and ⊘LV1 (SC PHASE) /EN-69P board so that the beam spot of the burst signal is overlapped with the 75% scale on the vectorscope.

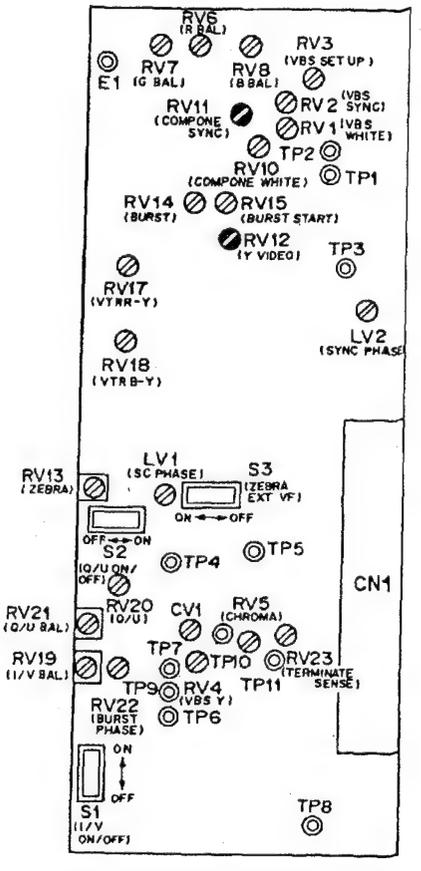


Note:

STEP 3-22. VTR Y Gain adjustment

Note: Be sure to connect the CA-50P/3AP camera adaptor with the BVP-70P camera.

Equipment: Oscilloscope,Waveform monitor
To be extended: EN-69P board
Trigger: HD (TP34/extension board)
Preparation
OUTPUT/DCC switch (side panel) "BARS/OFF"



EN-69P BOARD (COMPONENT SIDE)

Object: Color-bar signal

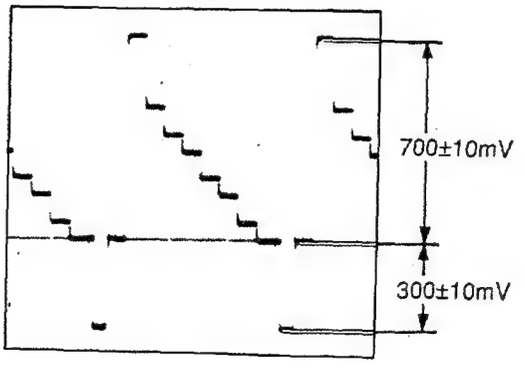
Monitor screen Waveform monitor

Lens Zoom:

Lens iris:

Test point: TP21/extension board
Adjust point: ⊘ RV12 (Y VIDEO)/EN-69P board
⊘ RV11 (COMPONE SYNC)/EN-69P board
Specification: Y VIDEO = 700 ± 10mV
SYNC = 300 ± 10mV

Adjustment procedures

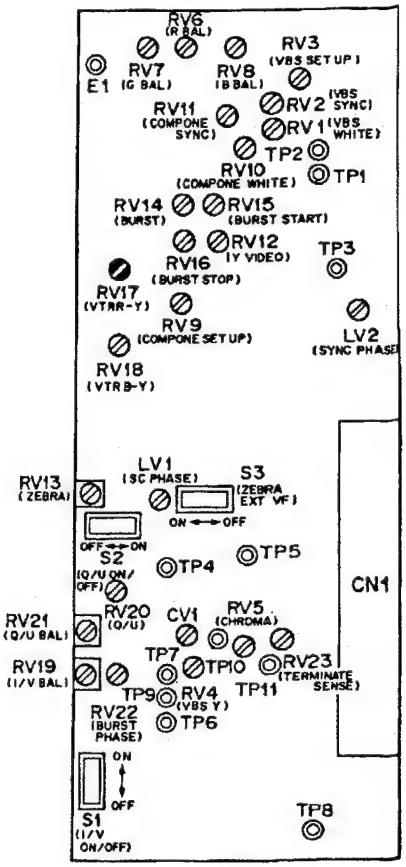


Note:

STEP 3-23. VTR R-Y Gain adjustment

Note: Be sure to connect the CA-50P/3AP camera adaptor with the BVP-70P camera.

Equipment: Oscilloscope
To be extended: EN-69P board
Trigger: HD(TP34/extension board)
Preparation
OUTPUT/DCC switch (side panel) "BARS/OFF"



EN-69/69P BOARD (COMPONENT SIDE)

Object: Color-bar signal

Monitor screen Waveform monitor

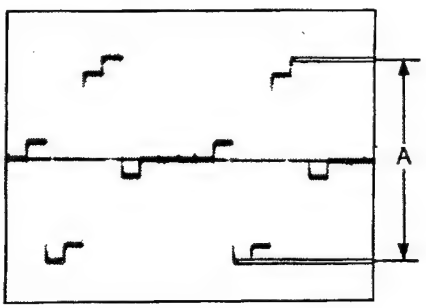
Lens Zoom:

Lens iris:

Test point: TP19/extension board
Adjust point: ⊘ RV17/EN-69P board

Specification: A = 525 ± 5mV

Adjustment procedurs



Note:

STEP 3-24. VTR B-Y Gain adjustment

Note: Be sure to connect the CA-50P/3AP camera adaptor with the BVP-70P camera.

Equipment: Oscilloscope
To be extended: EN-69P board
Trigger: HD(TP34/extension board)
Preparation
OUTPUT/DCC switch (side panel) "BARS/OFF"

Object: Color-bar signal

Monitor screen Waveform monitor

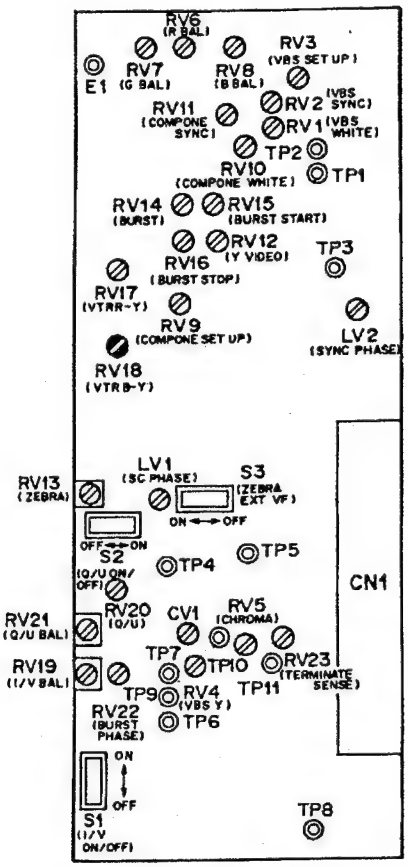
Lens Zoom:

Lens iris:

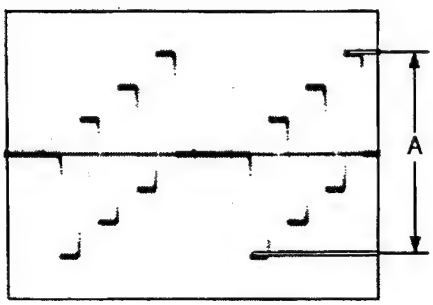
Test point: TP18/extension board
Adjust point: ⊘ RV18/EN-69P board

Specification: 525 ± 5mV

Adjustment procedurs



EN-69/69P BOARD (COMPONENT SIDE)



Note:

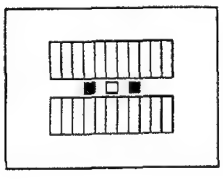
STEP 3-25. Zebra Level adjustment

Note:

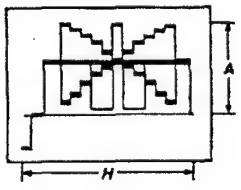
Equipment: Waveform monitor (WFM)
To be extended: EN-69P board
Trigger: HD(TP34/extension board)
Preparation
ENC/RGB switch (side panel) "ENC"
TALLY/ZEBRA ON/OFF switch (viewfinder) "ZEBRA"

Object: Grayscale chart

Monitor screen



Waveform Monitor

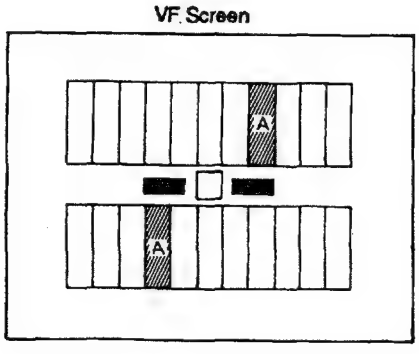


Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)

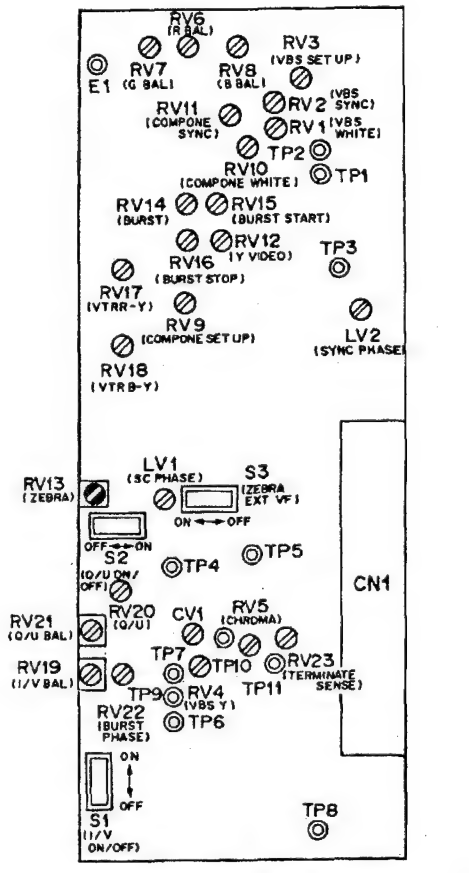
Test point: Viewfinder
Adjust point: ⊘ RV13/EN-69P board

Specification:

Adjustment procedurs
Adjust the ⊘ RV13 (ZEBRA)/EN-69P board so that the striped pattern appears in the portion A of the VF screen as shown below.



EN-69P BOARD (PANEL SIDE)



EN-69/69P BOARD (COMPONENT SIDE)

Note:

STEP 3-26. Gamma correction adjustment

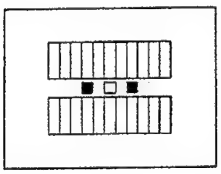
Note:

Equipment: Waveform monitor
To be extended: PR-138A board
Trigger: CP (TP35/extension board)
Preparation

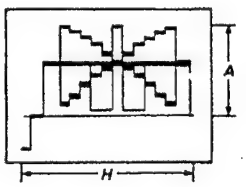
ENC/RGB switch (side panel)	"RGB"
G/OFF switch (side panel)	"G"
R/OFF/B switch (side panel)	"OFF"
S4 (WHT CLIP)/PR-138A board	"OFF"
S3 (γ ON/OFF)/PR-138A board	"ON"

Object: Grayscale chart

Monitor screen



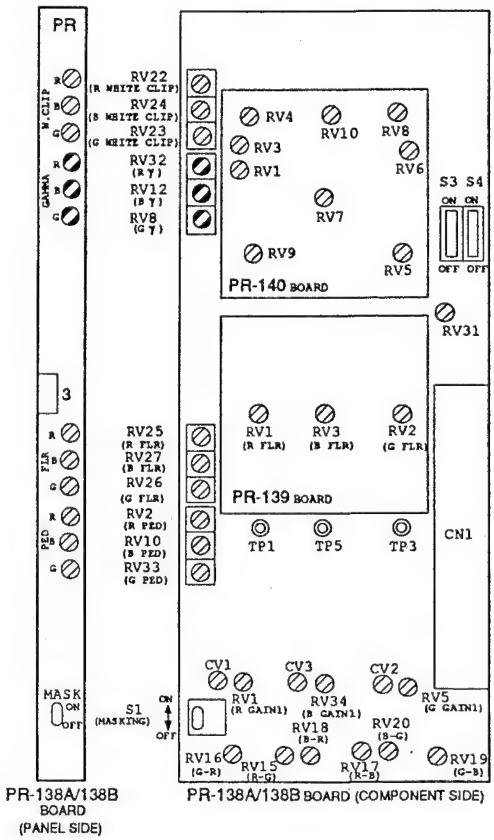
Waveform monitor



Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)

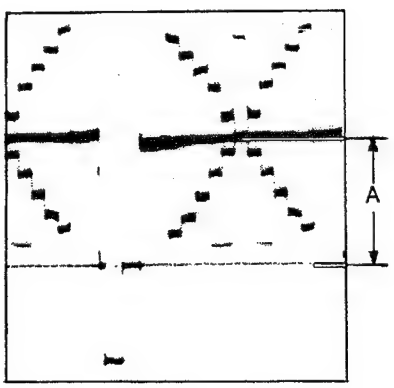
Test point: TEST OUT terminal
Adjust point: mentioned below

Specification: mentioned below

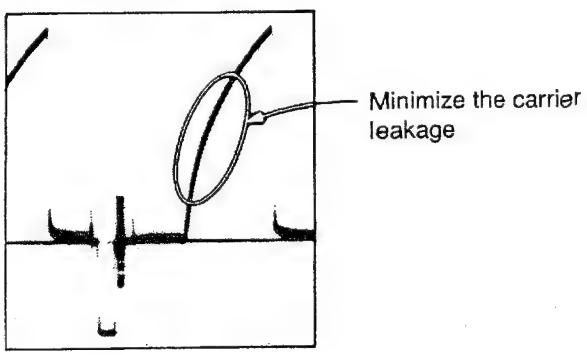


Adjustment procedures

1. Adjust the ⊘ RV8 (Gγ)/PR-138A board so that the cross point "A" at gray scale is 420 ± 20mV.



2. ENC/RGB switch (side panel) "ENC"
   S2 (TEST)/VA-85 board "ON"
3. Adjust the ⊘ RV12 and ⊘ RV32/PR-138A board to minimize the carrier leakage.



Note:

STEP 3-27. Manual Knee and white clip adjustment

Note:

Equipment: Waveform monitor (WFM)
To be extended: PR-138A board
Trigger: CP (TP35/extension board)
Preparation

Object: Test signal

Monitor screen — Waveform monitor

ENC/RGB switch (side panel) "RGB"
GAIN switch (side panel) "9"
OUTPUT/DCC switch (side panel) "CAM/OFF"
G/OFF switch (side panel) "G"
R/OFF/B switch (side panel) "OFF"
S2 (TEST) switch/VA-85 board "ON"
S3 (γ ON/OFF)/PR-138A board "ON"
S4 (WHT CLIP)/PR-138A board "ON"
⊘ RV1/PR-140 board → mechanical center
⊘ RV3/PR-140 board → mechanical center
⊘ RV4/PR-140 board → fully clockwise
⊘ RV8/PR-140 board → fully clockwise
⊘ RV10/PR-140 board → fully clockwise
⊘ RV22/PR-138A board → fully counterclockwise
⊘ RV23/PR-138A board → fully counterclockwise
⊘ RV24/PR-138A board → fully counterclockwise

Lens Zoom:

Lens iris:

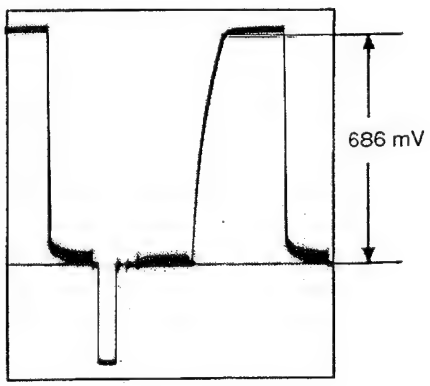
Test point: mentioned below
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedures
The adjustment values mentioned in STEP "3-29. Manual Knee and white clip adjustment" apply for the white clip level set to 770 mV. If you want to operate with a white clip level other than 770 mV, adjust the KNEE POINT, KNEE SLOPE, and WHITE CLIP LEVEL following the list below.

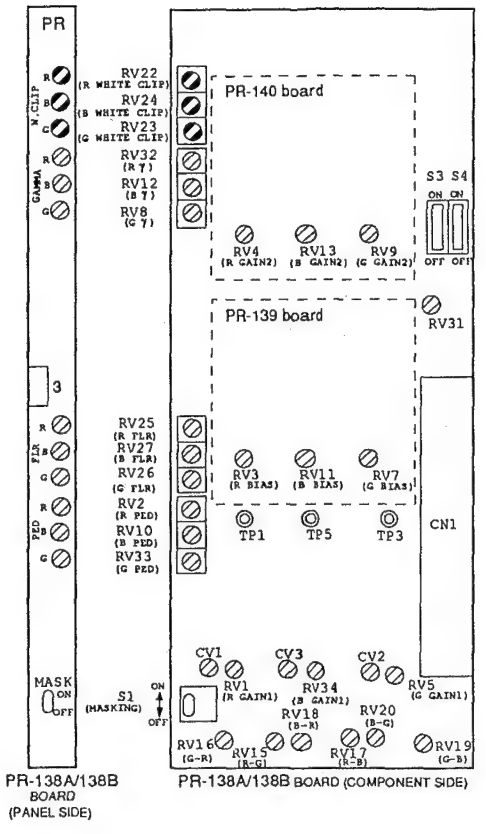
White clip level / Measuring point	770mV	750mV	735mV	720mV
MANUAL KNEE POINT ⊘ RV9/PR-140	686mV	686mV	672mV	672mV
KNEE SLOPE ⊘ RV8/PR-140	777mV	770mV	749mV	749mV
WHITE CLIP ⊘ RV23/PR-138A	770mV	749mV	735mV	721mV

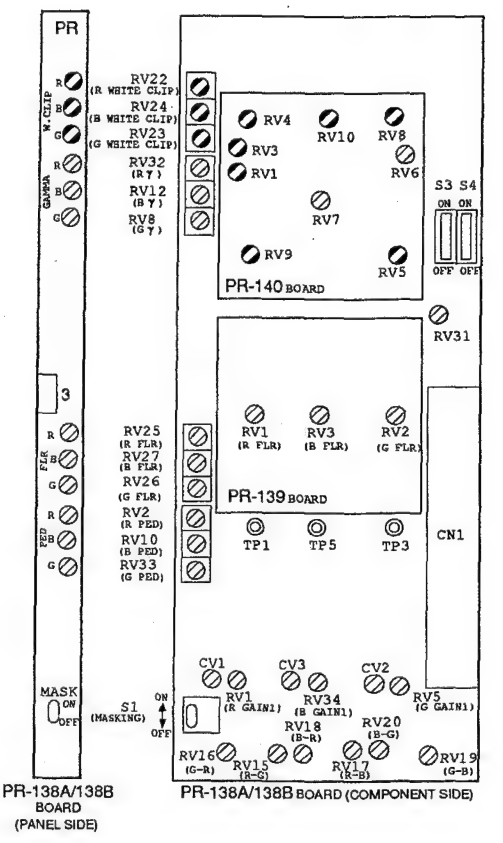
1. Adjust ⊘ RV9 (MANU POINT)/PR-140 board so that the knee point level at TEST OUT terminal is 686 ± 10mV.



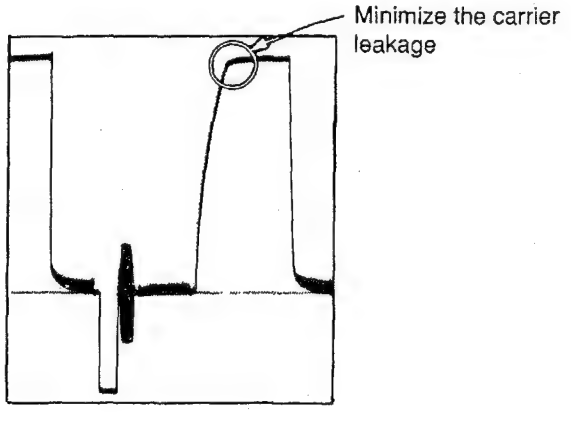
2. ENC/RGB switch (side panel) "ENC"

Note: Specifications of the STEP 3-27 is that for the white clip level set to 770 mV. When using the unit at other white clip level, change the knee point, knee slope, and white clip level, and perform adjustment, as shown below.



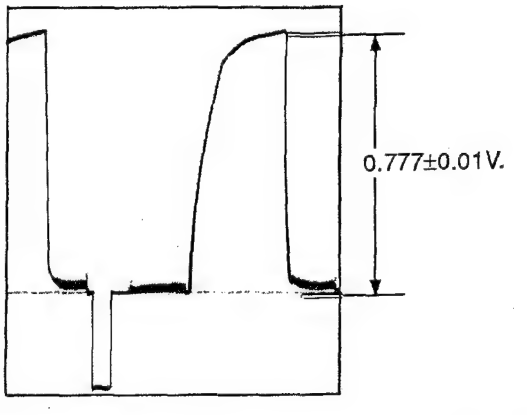


3. Adjust ⊘ RV1 (R POINT) AND ⊘ RV3 (B POINT)/PR-140 board so that the carrier leakage at the knee point of the TEST SAW waveform is minimized.



4. ENC/RGB switch (side panel) "RGB"
   G/OFF switch(side panel) "G"

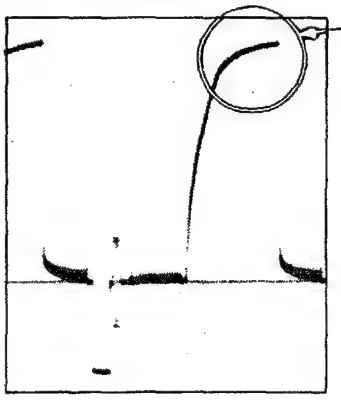
5. Adjust ⊘ RV8 (G SLOPE)/PR-140 board so that the peak level of the TEST SAW waveform is 777 ± 10mV.



6. ENC/RGB switch (side panel) "ENC"

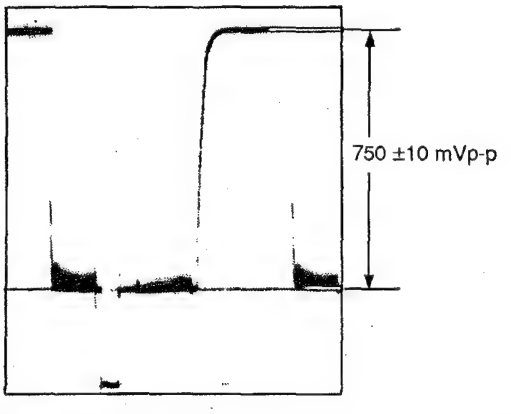
Note:

7. Adjust ◐ RV4 (R SLOPE) and ◐ RV10 (B SLOPE)/PR-140 board so that the carrier leakage of the TEST SAW waveform is minimized.



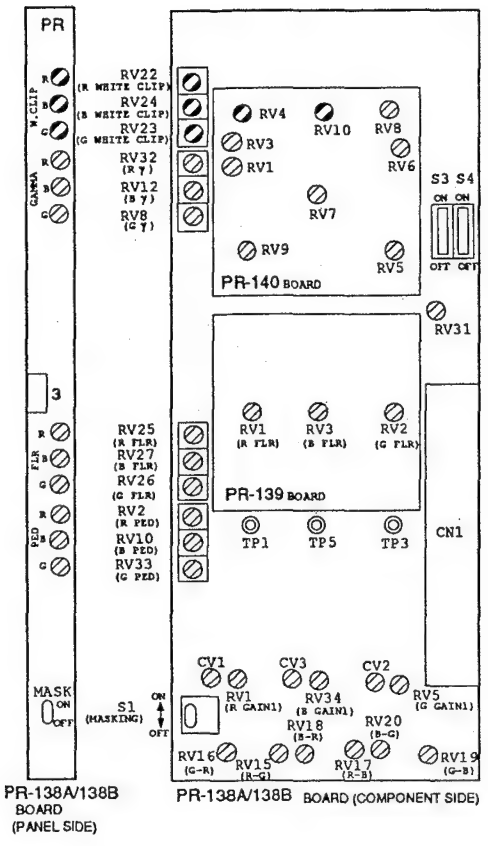
8. ENC/RGB switch (side panel) "RGB"
   G/OFF switch (side panel) "G"
   GAIN switch (side panel) "18"

9. Adjust ◐ RV23 (G WHT CLIP)/PR-138A board so that the TEST SAW waveform clips at 750 ± 10mV.

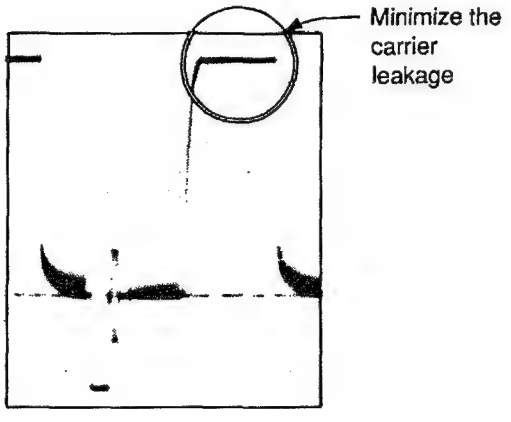


10. ENC/RGB switch (side panel) "ENC"

Note:



11. Adjust ⊘ RV22 (R WHT CLIP)and ⊘ RV24 (B WHT CLIP)/ PR-138A board so that the carrier leakage of the TEST SAW waveform is minimized.



Note:

STEP 3-28. Automatic Knee adjustment

Note: Be sure to complete the STEP 3-27. Manual knee and White Clip adjustment.

Equipment: Oscilloscope(DC mode),Waveform monitor
To be extended: PR-138A board
Trigger: CP(TP35/extension board)
Preparation

ENC/RGB switch (side panel)	"ENC"
GAIN switch (side panel)	"0"
OUTPUT/DCC switch (side panel)	"CAM/OFF"
S2(TEST) switch/VA-85 board	"ON"
S3 (γ ON/OFF)/PR-138A board	"ON"
S4 (WHT CLIP)/PR-138A board	"ON"
⊘ RV7 (AUTO LIMIT)/PR-140 board	→ mechanical center
⊘ RV6 (AUTO GAIN)/PR-140 board	→ fully counterclockwise

Object: Test signal

Monitor screen Waveform monitor

Lens Zoom:

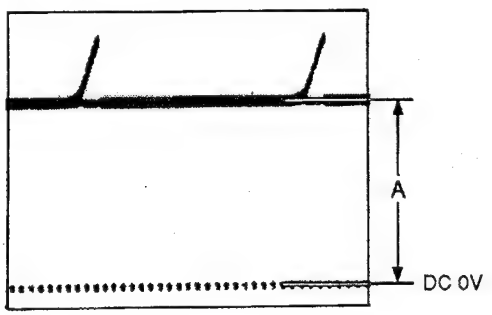
Lens iris:

Test point: mentioned below
Adjust point: mentioned below

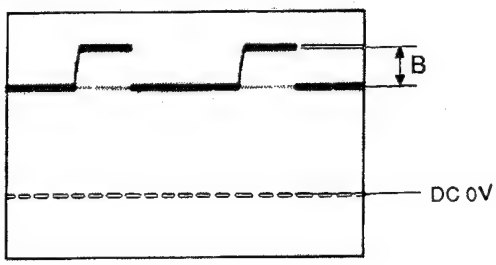
Specification: mentioned below

Adjustment procedures

1. GAIN switch (side panel) "18"
2. Adjust ⊘ RV5/PR-140 board so that the DC level "A" at TP1/PR-140 board is 0.3 ± 0.05 Vdc.

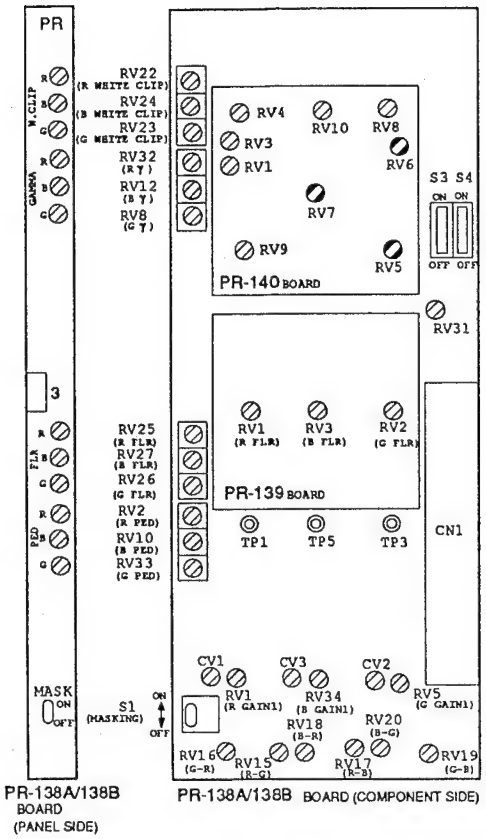


3. Adjust ⊘ RV7/PR-140 board so that the waveform level "B" at TP2/PR-140 board is 0.35 ± 0.05 Vdc.

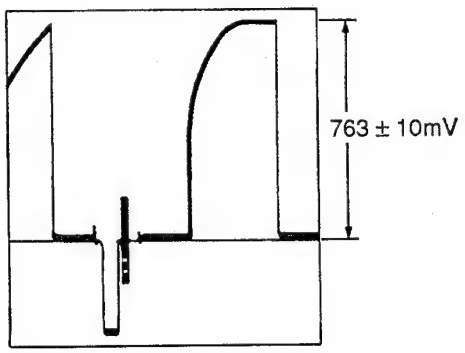


4. OUTPUT/DCC switch (side panel) "ON"
   GAIN switch (side panel) "18"

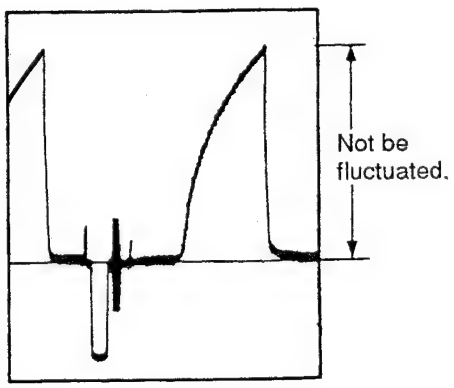
Note:



5. Adjust ⊘RV6/PR-140 board so that the peak level of TEST SAW waveform is 763 ± 10mV.



6. • GAIN switch (side panel) "0"
   • Adjust ⊘RV5/PR-140 board so that the peak level of waveform does not change even if that DCC switch is set any position of ON or OFF.



Note:

STEP 4. IMAGE ENHUNCER SYSTEM

STEP 1. Power Supply System

↓

STEP 2. Synchronizing Signal System

↓

STEP 3. Video Signal System

↓

STEP 4-1. Clip Level adjustment

↓

STEP 4-2. V DTL Null adjustment

↓

STEP 4-3. DTL Black Clip adjustment

↓

STEP 4-4. DTL Alias adjustment

↓

STEP 4-5. H DTL NULL adjustment

↓

STEP 4-6. Black Balance adjustment

↓

STEP 4-7. Crispening adjustment

↓

STEP 4-8. Level Dependent adjustment

↓

STEP 4-9. Aperture Alias adjustment

↓

STEP 4-10. Aperture DTL Null adjustment

↓

STEP 4-11. H/V RATIO adjustment

↓

STEP 4-12. Aperture adjustment

↓

STEP 4-13. Detail Level adjustment

↓

STEP 5. Resolution adjustment

↓

STEP 6. Power save adjustment

↓

STEP 7. Auto Control System

↓

STEP 8. Viewfinder System

Note: Do not attempt to reset the following controls because their adjustments are very critical and delicate in the field.

- ⊘CV1/IE-25P board
- ⊘CV2/IE-25P board
- ⊘CV3/IE-25P board

STEP 4-1. Clip Level adjustment

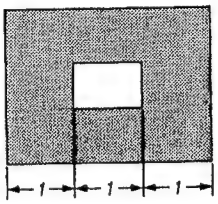
Note:

Equipment: Oscilloscope
To be extended: IE-25P board
Trigger: TP10/extension board
Preparation

ENC/RGB switch(side panel)	"ENC"
GAIN switch(side panel)	"9"
S1(DTL)/IE-25P board	"ON"
S2(APEARTURE)/IE-25P board	"OFF"

Object: White window chart

Monitor screen Waveform monitor

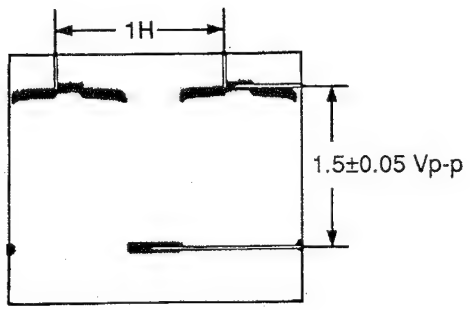


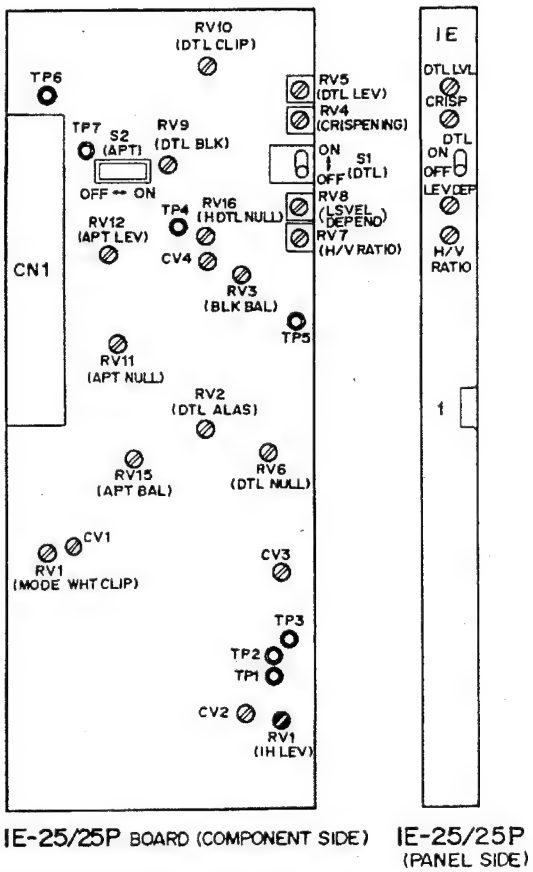
Lens Zoom: Shoot the white window chart as stated above.
Lens iris: Open

Test point: TP6/extension board
Adjust point: ⊘RV1(CLIP LEV)/IE-25P

Specification: 1.5 ± 0.05 Vp-p

Adjustment procedures
Open the lens iris slowly and adjust ⊘RV1 (CLIP LEV)/IE-25P board so that the waveform at TP6/extension board clips at 1.5 ± 0.05 Vp-p.





IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)

Note: After this adjustment is completed, set the GAIN selector (side panel) to "0".

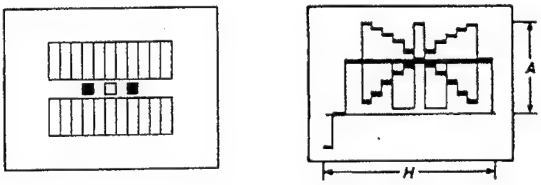
STEP 4-2. V DTL Null adjustment

Note:

Equipment: Oscilloscope,Waveform monitor
To be extended: IE-25P board
Trigger: TP35/extension board
Preparation
ENC/RGB switch(side panel) "ENC"
S1(DTL)/IE-25P board "ON"

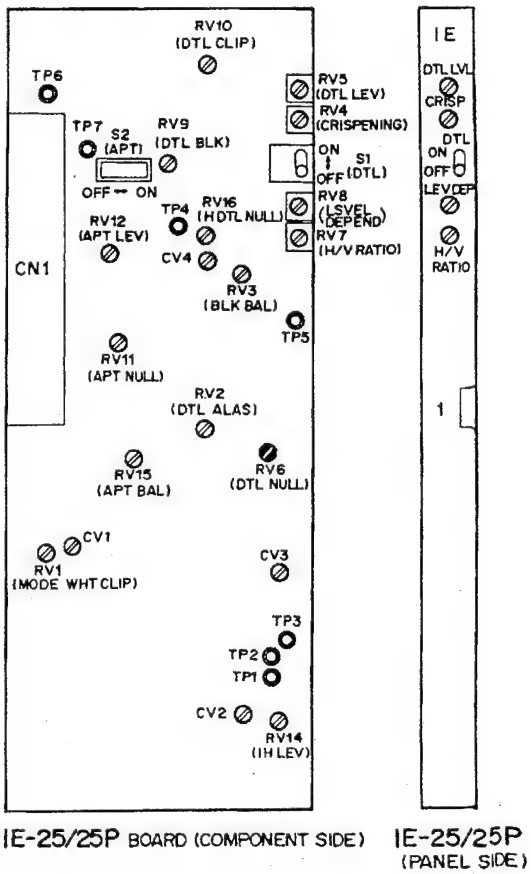
Object: Gray scale chart

Monitor screen Waveform monitor

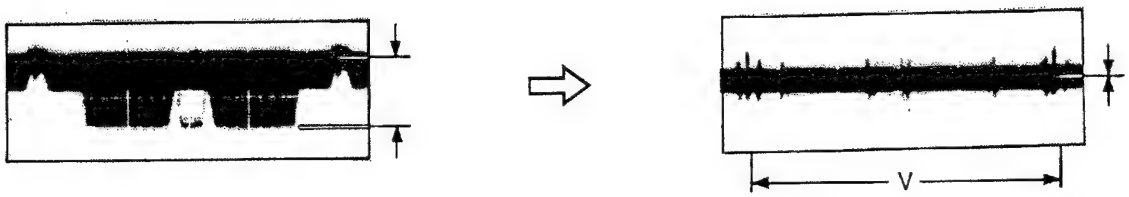


Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TP5/IE-25P board
Adjust point: ⊘RV6/IE-25P board

Specification: mentioned below



Adjustment procedures
Adjust the ⊘RV6/IE-25P board so that the video level is "Zero" as shown below.



Note:

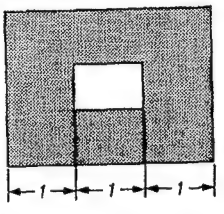
STEP 4-3. DTL Black Clip adjustment

Note:

Equipment: Oscilloscope, waveform monitor
To be extended: IE-25P board
Trigger: TP35/extension board
Preparation
ENC/RGB switch(side panel) "ENC"

Object: White window chart

Monitor screen Waveform monitor

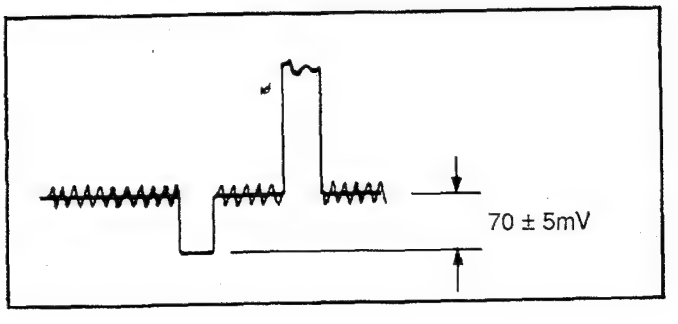


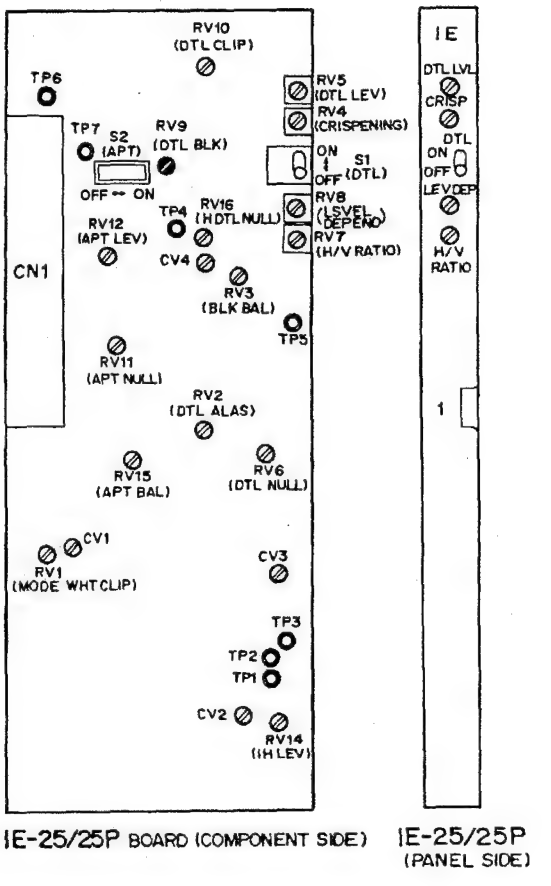
Lens Zoom: Shoot the white window chart as stated above.
Lens iris: Open

Test point: TP5(GND:E1)/IE-25P board
Adjust point: RV9/IE-25P board

Specification: mentioned below

Adjustment procedures





IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)

Note:

STEP 4-4. DTL Alias adjustment

Note:

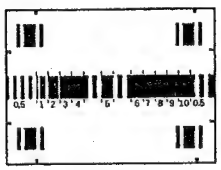
Equipment: Waveform monitor
To be extended: IE-25P board
Trigger:
Preparation

ENC/RGB switch (side panel)	"ENC"
S1 (DTL ON/OFF) switch/IE-25P board	"ON"
S2 (APERTURE) switch/IE-25P board	"OFF"

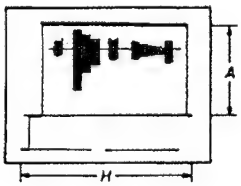
- ⊘ RV5 (DTL)/IE-25P board → fully clockwise
- ⊘ RV7 (H/V RATIO)/IE-25 board → fully clockwise

Object: Multiburst chart

Monitor screen



Waveform monitor



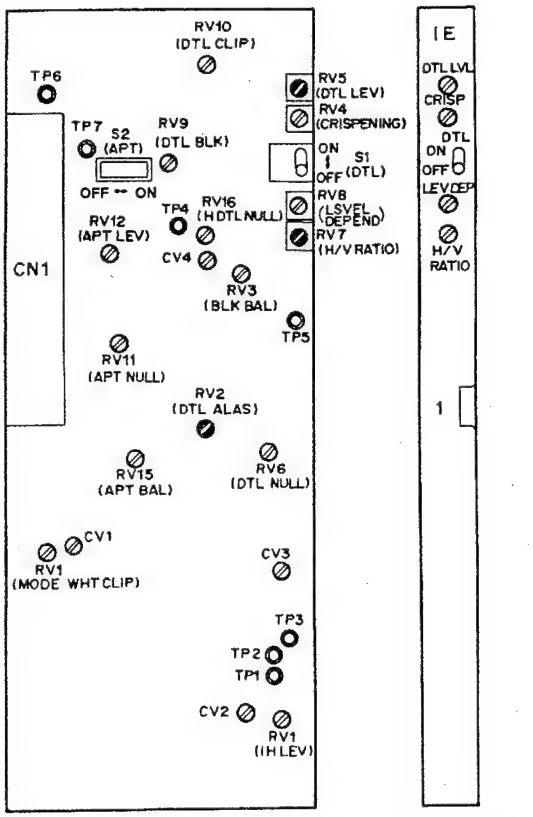
Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 630 ± 10 mV (at TEST OUT terminal)

Test point: TEST OUT terminal
Adjust point: ⊘RV2/IE-25P board

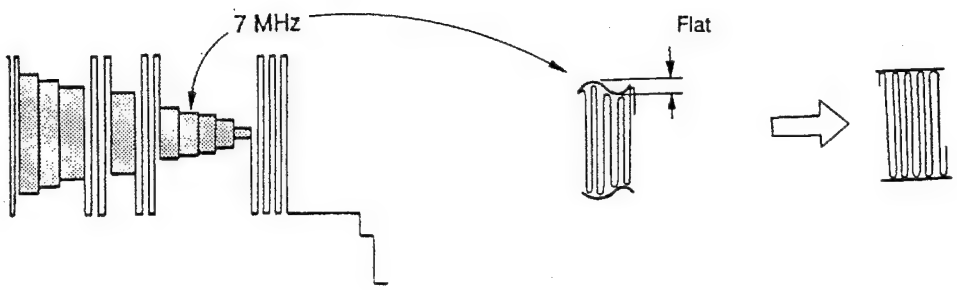
Specification: mentioned below

Adjustment procedures

1. Pan so that the 7 MHz of the multiburst chart is positioned at center on the monitor screen.
2. Adjust the ⊘ RV2/IE-25P board so that the waveform signal of 7 MHz is flat.



IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)



Note:

STEP 4-5. H DTL NULL adjustment

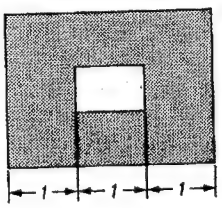
Note:

Equipment: Oscilloscope,Waveform monitor
To be extended: IE-25P board
Trigger: TP10/extension board
Preparation

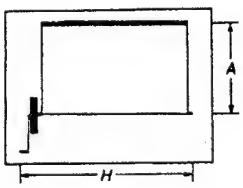
ENC/RGB switch(side panel)	"ENC"
S1(DTL)/IE-25P board	"ON"
S2(APEARTURE)/IE-25P board	"OFF"

Object: White window chart

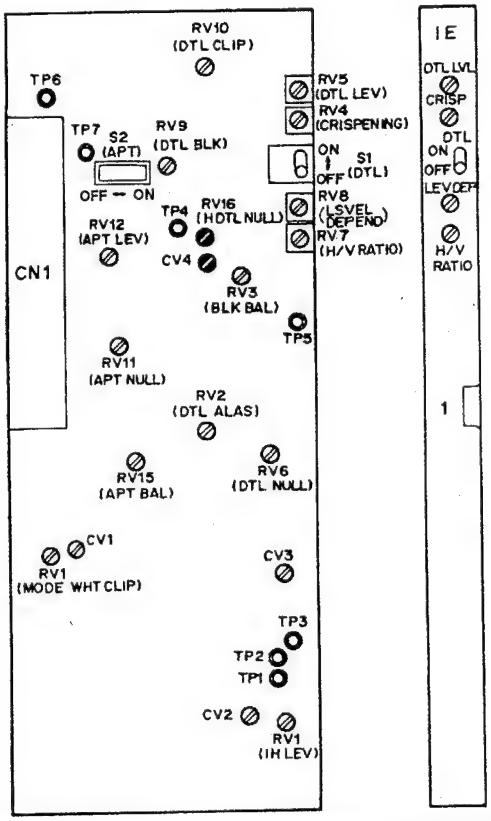
Monitor screen



Waveform monitor



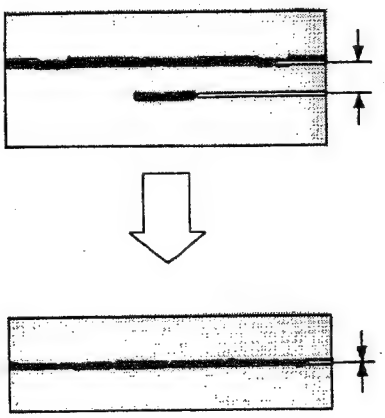
Lens Zoom: Shoot the white window chart as stated above.
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TP4(GND:E1)/IE-25P board
Adjust point: ⊘RV16/IE-25P board
⊘CV4/IE-25P board
Specification: mentioned below



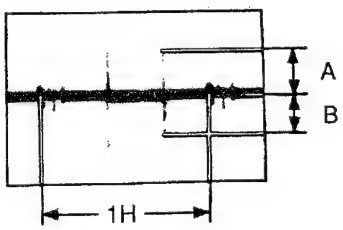
IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)

Adjustment procedures

1. Adjust the ⊘RV16/IE-25P board so that the white signal is level as shown below.



2. Adjust the ⊘CV4/IE-25P board so that the detail signal is the level as shown below.



A = B

Note:

STEP 4-6. Black Balance adjustment

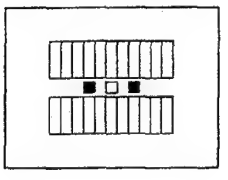
Note:

Equipment: Oscilloscope,Waveform monitor
To be extended: IE-25P board
Trigger: TP10/extension board
Preparation

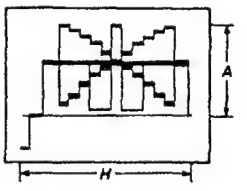
S1(DTL ON/OFF)/IE-25P board	"ON"	⊘RV5(DTL)/IE-25P board	→ fully clockwise
S2(APEARTURE)/IE-25P board	"OFF"	⊘RV4(CRISP)/IE-25P board	→ fully counterclockwise
		⊘RV8(LEV DEP)/IE-25P board	→ fully counterclockwise
		⊘RV7(H/V RATIO)/IE-25P board	→ *mechanical center*

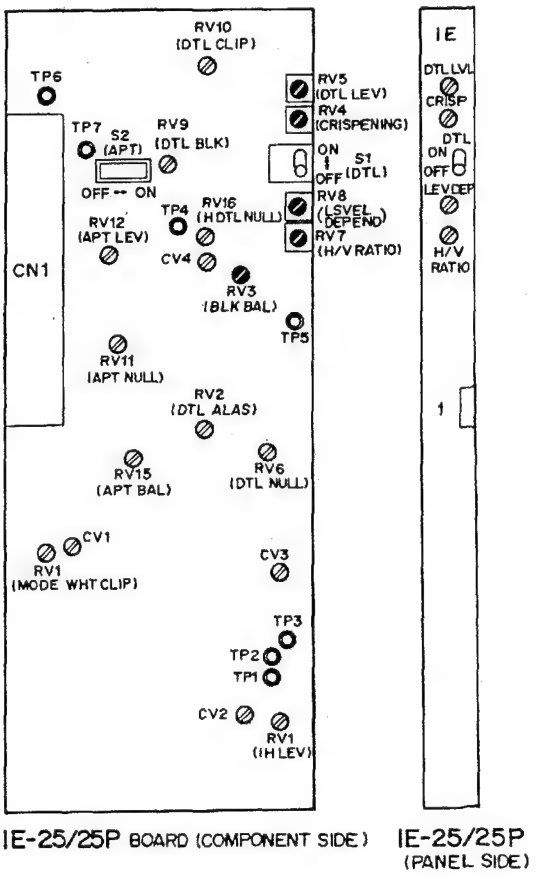
Object: Grayscale chart

Monitor screen



Waveform monitor



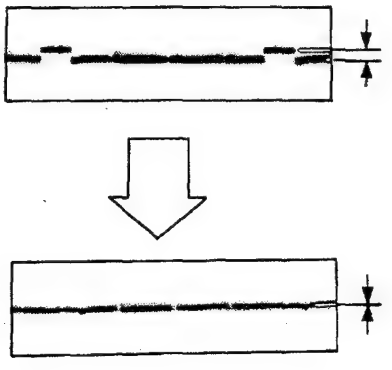


IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)

Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TP6(GND:E1)/IE-25P board
Adjust point: ⊘RV3/IE-25P board

Specification: *mentioned below*

Adjustment procedures



Note:

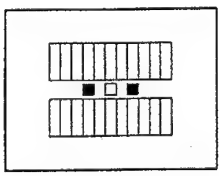
STEP 4-7. CRISPENING adjustment

Note:

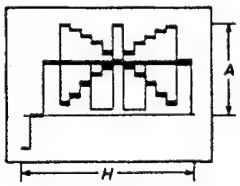
Equipment: Waveform monitor
To be extended: IE-25P board
Trigger:
Preparation
S1 (DTL ON/OFF) switch/IE-25P board "ON"
⊘ RV8 (LEV DEP)/IE-25P board → fully counterclock wise
⊘ RV7 (H/V RATIO)/IE-25P board→ fully counterclock wise

Object: Grayscale chart

Monitor screen



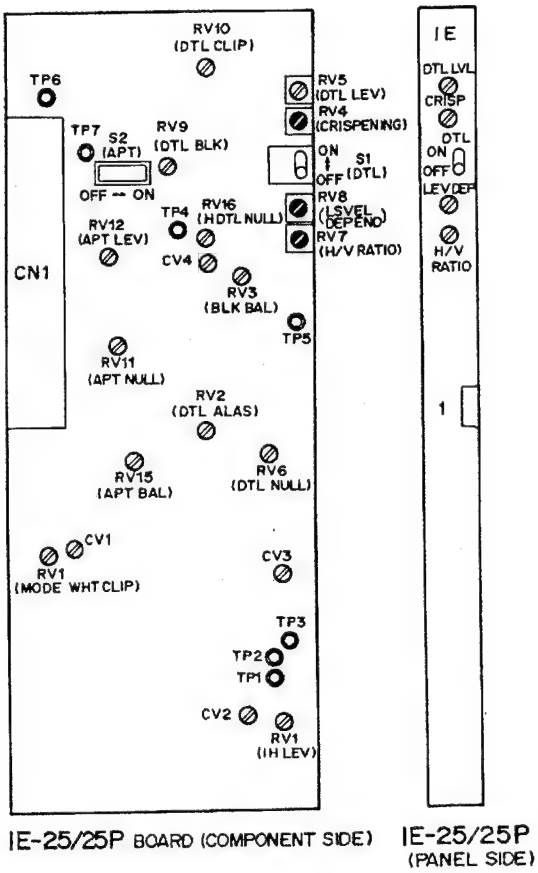
Waveform monitor



Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 686 ± 10 mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘RV4/IE-25P board

Specification: mentioned below

Adjustment procedures
Adjust the ⊘ RV4 (CLISP)/IE-25P board for such a position that noise of the output waveform on the waveform monitor starts to be reduced.



Note:

STEP 4-8. Level Dependent adjustment

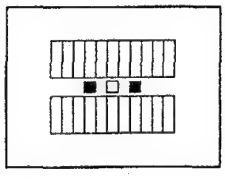
Note:

Equipment: Waveform monitor(WFM)
To be extended:
Trigger:
Preparation

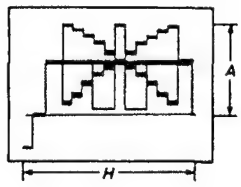
S1(DTL ON/OFF)/IE-25P board	"ON"
S2(APEARTURE)/IE-25P board	"OFF"
ENC/RGB switch(side panel)	"RGB"
G/OFF switch(side panel)	"G"
R/OFF/B switch(side panel)	"OFF"

Object: Grayscale chart

Monitor screen



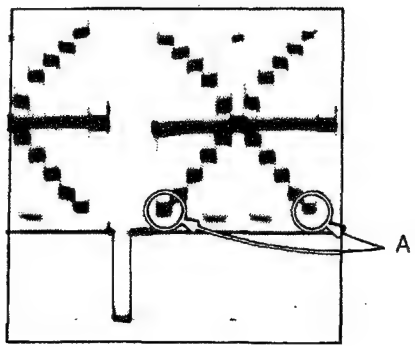
Waveform monitor

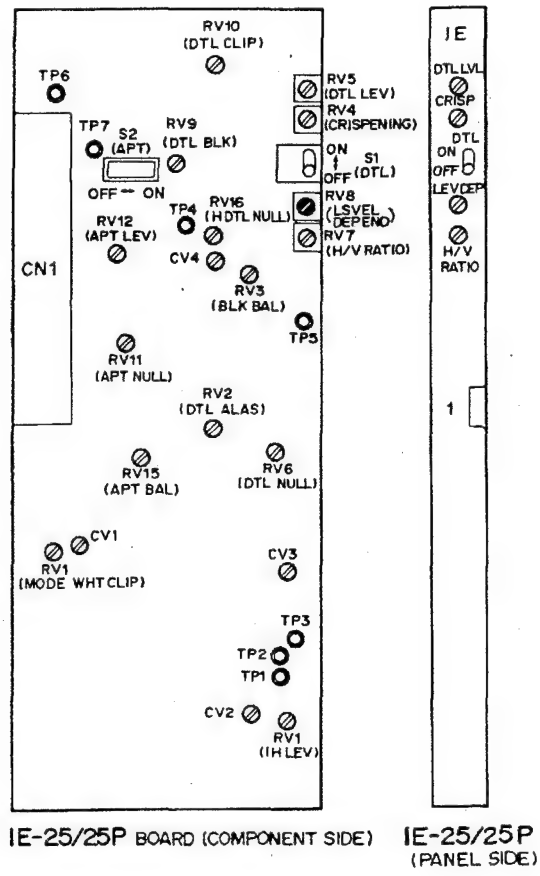


Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘RV8(LEV DEP)/IE-25P board

Specification: mentioned below

Adjustment procedures
The detail signal is not added to the portion "A" of the waveform at TEST OUT terminal.





IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)

Note:

STEP 4-9. Aperture Alias adjustment

Note:

Equipment: Waveform monitor
To be extended: IE-25P board
Trigger:
Preparation

ENC/RGB switch (side panel)	"ENC"
S1 (DTL ON/OFF)/IE-25P board	"OFF"
S2 (APEARTURE)/IE-25P board	"ON"

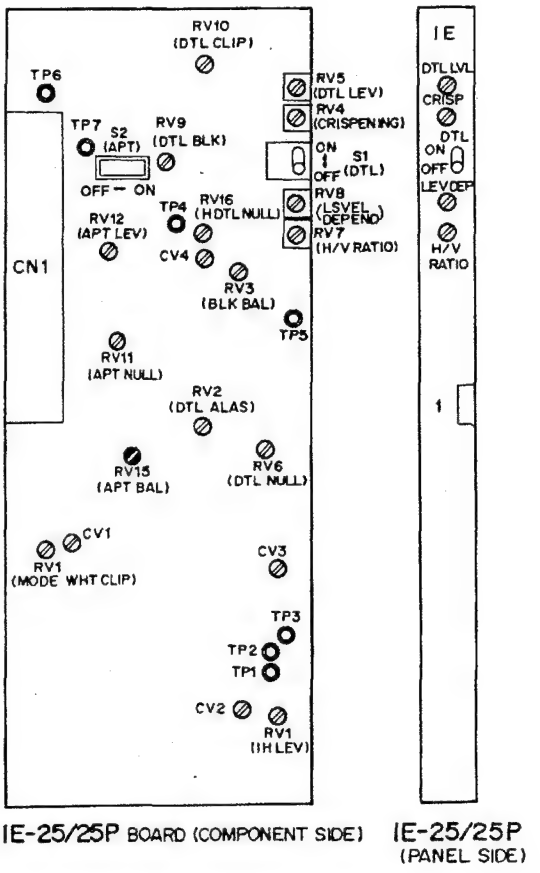
⊘RV11 (APERTURE NULL)/IE-25P board → fully clockwise
⊘RV7 (H/V RATIO)/IE-25 board → fully clockwise

Object: Multiburst chart

Monitor screen Waveform monitor

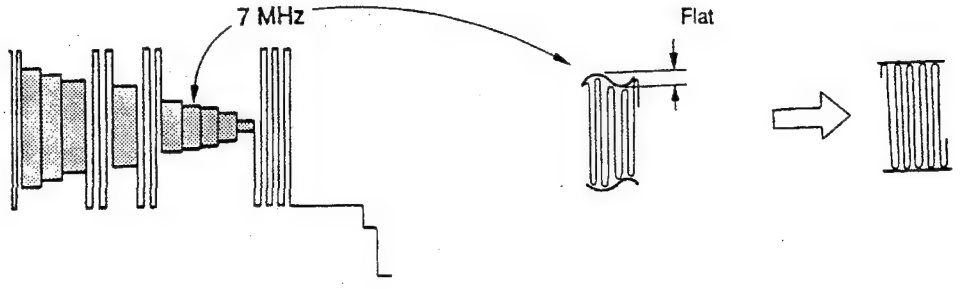
Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 630 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘RV15/IE-25P board

Specification: *mentioned below*



Adjustment procedures

1. Pan so that the 7MHz of the multi-burst chart is positioned at center on the monitor screen.
2. Adjust the ⊘ RV15/IE-25P board so that the waveform signal of 7 MHz is flat.



Note:

STEP 4-10. Apearture Detail Null adjustment

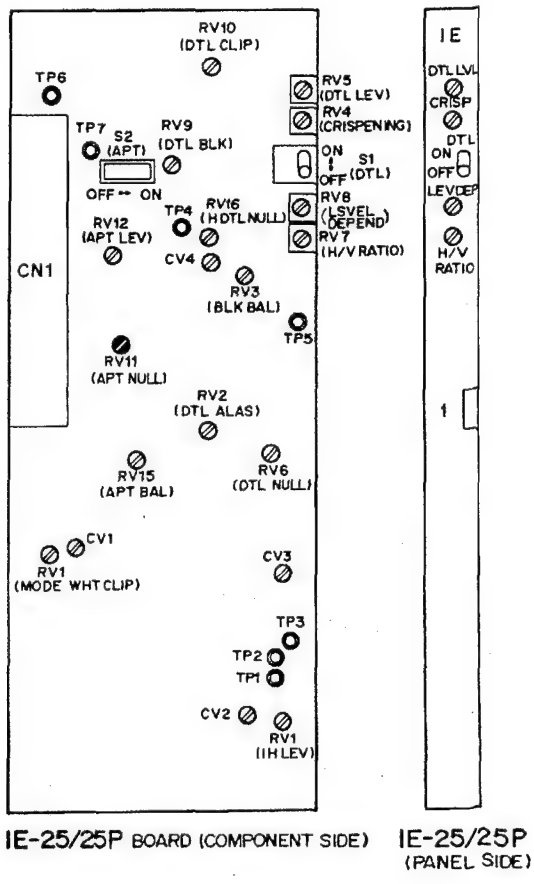
Note:

Equipment: Oscilloscope
To be extended: IE-25P board
Trigger: TP10/extension board
Preparation:

S2(TEST)/VA-85 board	"ON"
S1(DTL ON/OFF)/IE-25P board	"OFF"
S2(APEARTURE)/IE-25P board	"ON"

Object: Test signal

Monitor screen Waveform monitor



IE-25/25P BOARD (COMPONENT SIDE) IE-25/25P (PANEL SIDE)

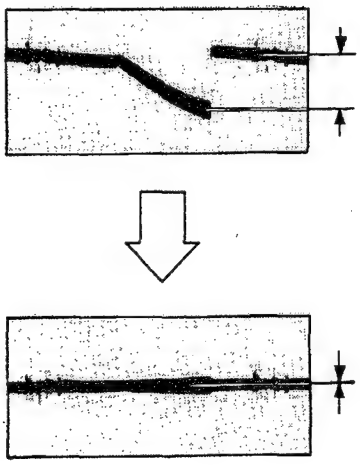
Lens Zoom:

Lens iris:

Test point: TP7(GND:E1)/IE-25P board
Adjust point: ◐RV11/IE-25P board

Specification: mentioned below

Adjustment procedures



Note:

STEP 4-11. H/V RATIO adjustment

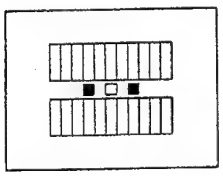
Note:

Equipment: Monitor screen
To be extended:
Trigger:
Preparation

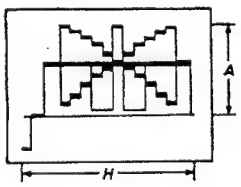
S1(DTL ON/OFF)/IE-25P board	"ON"
S2(APEARTURE)/IE-25P board	"OFF"
⊘RV5(DTL)/IE-25P board	"fully clockwise"

Object: Grayscale chart

Monitor screen



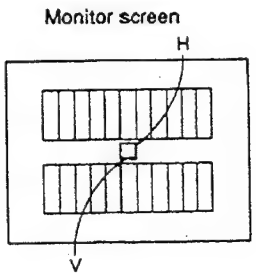
Waveform monitor

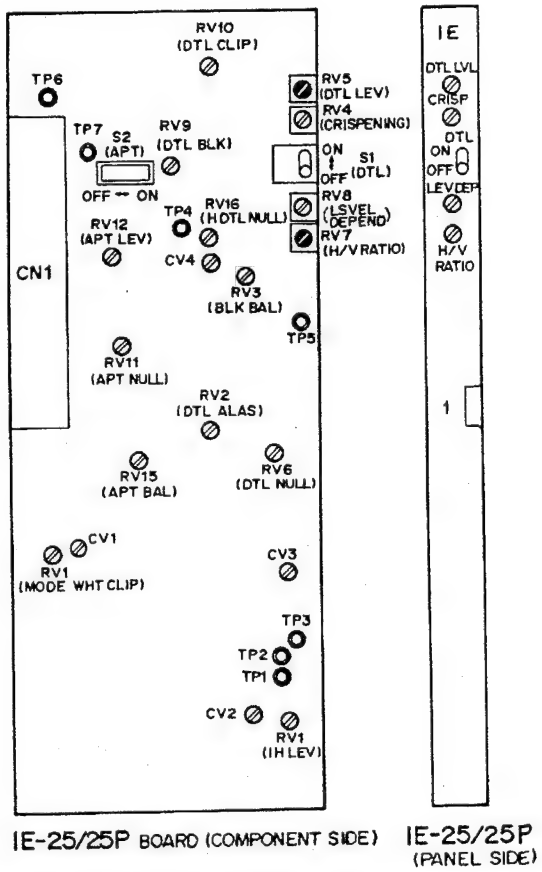


Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘RV7(H/V RATIO)/IE-25P board

Specification: mentioned below

Adjustment procedures
Adjust ⊘RV7(H/V RATIO)/IE-25P board so that the H and V detail amounts to be added are equivalent.



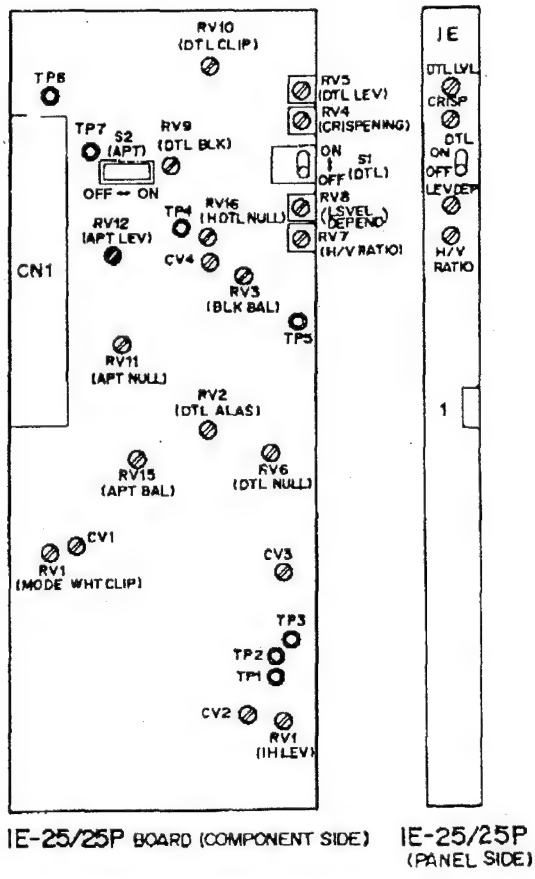


Note:

STEP 4-12. Apearture adjustment

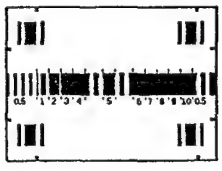
Note:

Equipment: Waveform monitor(WFM)
To be extended: IE-25P board
Trigger:
Preparation
S1(DTL ON/OFF)/IE-25P board "OFF"
S2(APEARTURE)/IE-25P board "ON"



Object: Multiburst chart

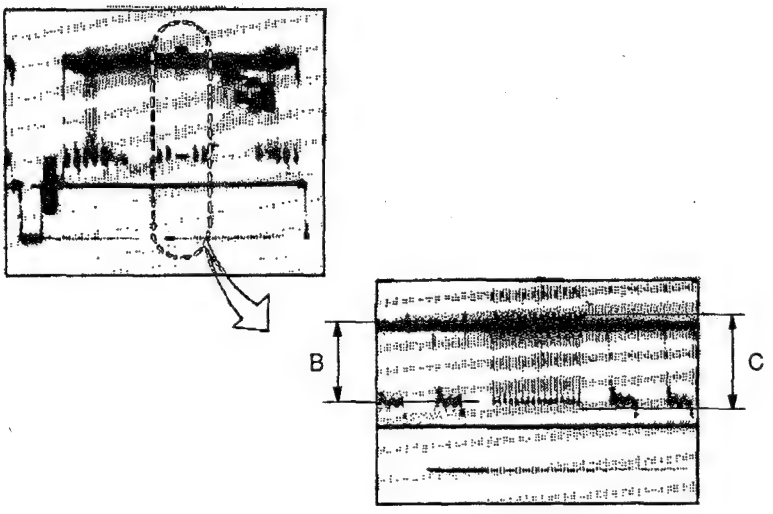
Monitor screen Waveform monitor



Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 630 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘ RV12/IE-25P board

Specification: B=C (B:Referance Value)

Adjustment procedures



Note:

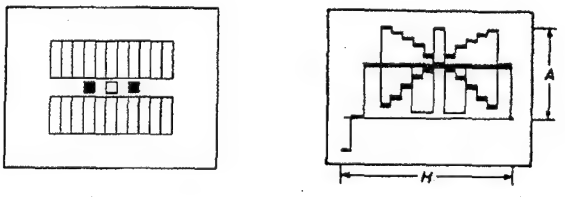
STEP 4-13. Detail Level adjustment

Note:

Equipment: Monitor screen
To be extended:
Trigger:
Preparation
S1(DTL ON/OFF)/IE-25P board "ON"
S2(APEARTURE)/IE-25P board "OFF"

Object: Grayscale chart

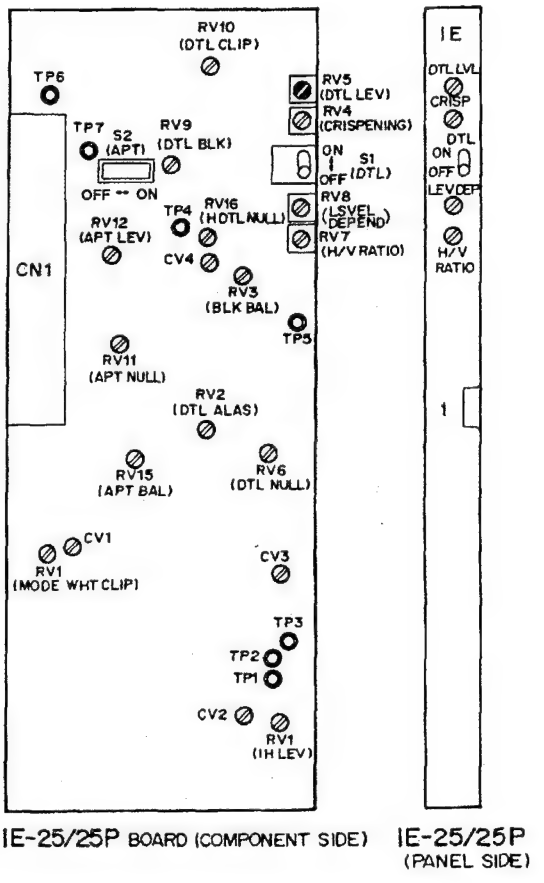
Monitor screen *Waveform monitor*



Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 560 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ⊘RV5(DTL)/IE-25P board

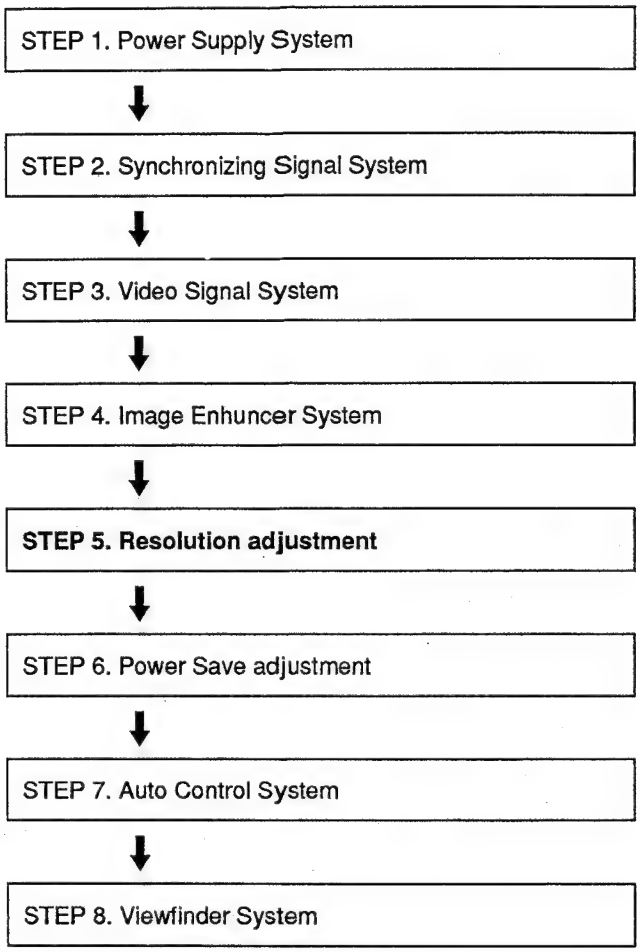
Specification: *mentioned below*

Adjustment procedures
Set the detail level according to the users'requist by adjusting ⊘RV5(DTL)/IE-25P board.



Note:

STEP 5. Resolution adjustment



STEP 5. Resolution adjustment

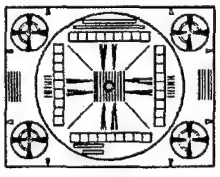
Note:

Equipment: *Monitor screen*
To be extended: VA-85 board
Trigger:
Preparation

S1(DTL ON/OFF)/IE-25P board	"OFF"
ENC/RGB switch(side panel)	"RGB"
G/OFF switch(side panel)	"OFF"
R/OFF/B switch(side panel)	"R"
S1(G/-G)/RG-20P board	"-G"

Object: Resolution chart

Monitor screen *Waveform monitor*

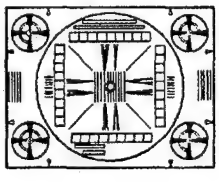


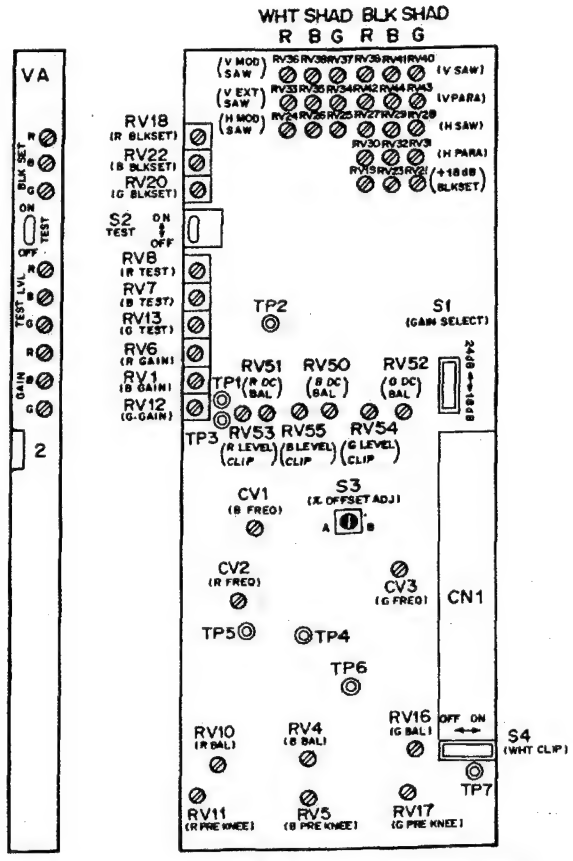
Lens Zoom: Underscanned picture frame on the monitor = *chart frame*
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ◓S3(π OFFSET)/VA-85 board

Specification: more than 700 TV lines

Adjustment procedures

1. Adjust ◓S3(π OFFSET)/VA-85 board so that the picture error of R-ch and G-ch is minimized.
2. ENC/RGB switch(side panel) "ENC"
   S1(DTL)/IE-25P board "ON"
   Object: Resolution chart





3. Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor screen.
4. Make sure that the resolution of more than 700 TV lines can be seen on the monitor screen.

Note: After this adjustment is completed, set the switches as follows;

ENC/RGB switch(side panel)	"ENC"
S1(G/-G)/RG-20P board	"G"

STEP 6. Power Save adjustment

STEP 1. Power Supply System

↓

STEP 2. Synchronizing Signal System

↓

STEP 3. Video Signal System

↓

STEP 4. Image Enhuncer System

↓

STEP 5. Resolution adjustment

↓

STEP 6. Power Save adjustment

↓

STEP 7. Auto Control System

↓

STEP 8. Viewfinder System

STEP 6. Power Save adjustment

Note:

Equipment: Digital Voltmeter
To be extended: EN-69P board
Trigger:
Preparation

Object:

Monitor screen Waveform monitor

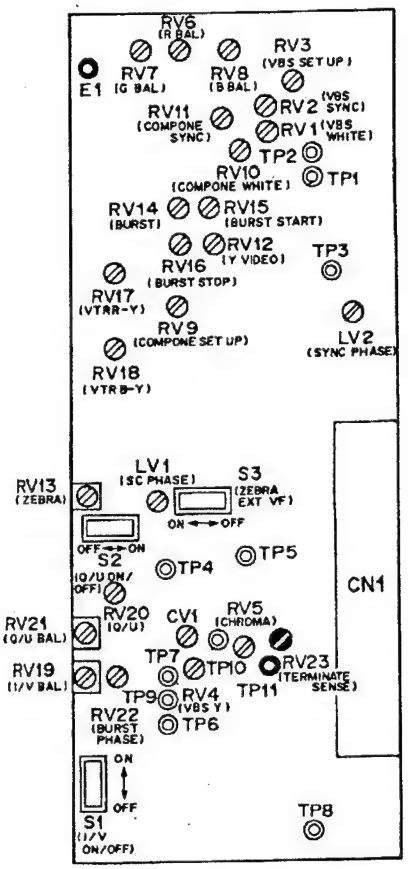
Lens Zoom:

Lens iris:

Test point: TP11(GND:E1)/EN-69P board
Adjust point: RV23/EN-69P board

Specification: −0.45±0.1Vdc

Adjustment procedurs



EN-69/69P BOARD (COMPONENT SIDE)

Note: Confirm that the waveform at TP8/extension board is fed when the ENC/RGB selector(side panel) is set to "ENC" and it is not fed when the selector is set to "RGB".

STEP 7. AUTO CONTROL SYSTEM

STEP 1. Power Supply System

↓

STEP 2. Synchronizing Signal System

↓

STEP 3. Video Signal System

↓

STEP 4. Image Enhuncer System

↓

STEP 5. Resolution adjustment

↓

STEP 6. Power Save adjustment

↓

STEP 7-1. Auto Iris adjustment

↓

STEP 7-2. LOW VIDEO adjustment

↓

STEP 7-3. Character Size adjustment

↓

8. Viewfinder System

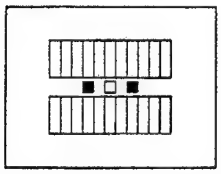
STEP 7-1. Auto Iris adjustment

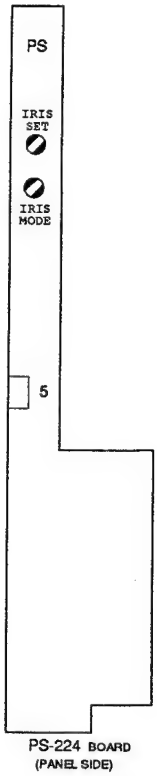
Note:

Equipment: Waveform monitor(WFM)
To be extended:
Trigger:
Preparation
ENC/RGB switch(side panel) "ENC"
Iris AUTO/MANU switch(Lens) "AUTO"
OUTPUT/DCC switch(side panel) "CAM/ON"

Object: Grauscale chart

Monitor screen Waveform monitor



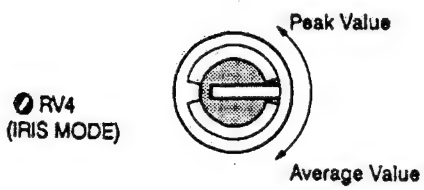


Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris:

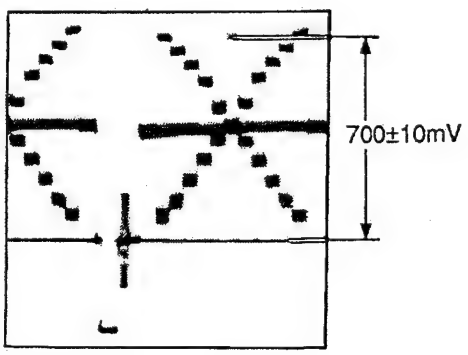
Test point: TEST OUT terminal
Adjust point: ⊘ RV5(IRIS SET)/PS-224 board
⊘ RV4(IRIS MODE)/PS-224 board
Specification:

Adjustment procedures

1. The iris control operation is controlled by mixing the peak level of the video signal with the average of it. That mixing ratio can be set by adjusting ⊘ RV4(IRIS MODE)/PS-224 board.
   Set the mode according to the users'requist.
   Normally set it at the center.



2. Adjust ⊘ RV5(IRIS SET)/PS-224 board so that the white level at TEST OUT terminal is 700 ± 10 mV.



Note: After this adjustment is completed, set the iris control AUTO/MANU switch(Lens) at "MANU" and OUTPUT/DCC switch(side panel) at "CAM/OFF"

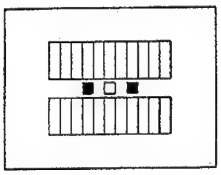
STEP 7-2. LOW VIDEO adjustment

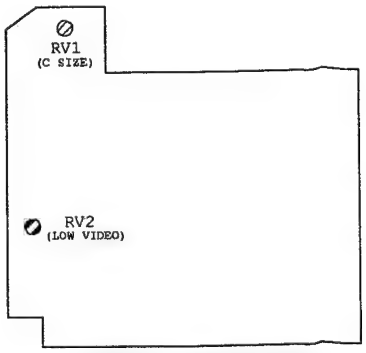
Note:

Equipment: Viewfinder screen
To be extended:
Trigger:
Preparation
ENC/RGB switch(side panel) "ENC"

Object: Grauscale chart

Monitor screen Waveform monitor





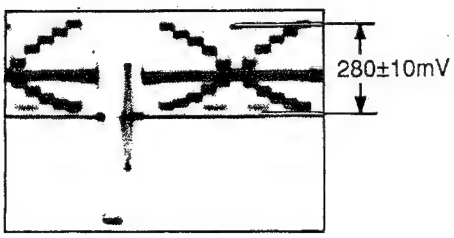
AT-58 BOARD (COMPONENT SIDE)

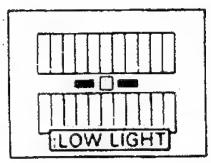
Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: Mentioned below

Test point: TEST OUT terminal
Adjust point: ⊘RV2(LOW VIDEO)/AT-58 board

Specification:

Adjustment procedures
1. Adjust the iris control so that the wihte level at TEST OUT terminal is 280 ± 10mV.
2. Turn ⊘RV2(LOW VIDEO)/AT-58 board from the left most position clockwise slowly until the "LOW LIGHT" is displayed on the VF screen.





Note:

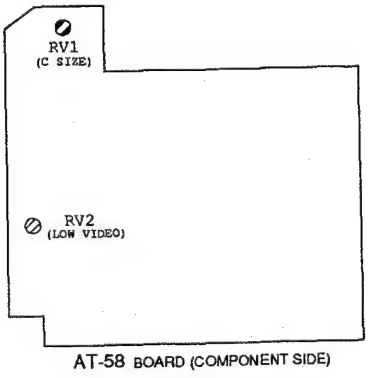
STEP 7-3. Character Size adjustment

Note:

Equipment: Viewfinder screen
To be extended:
Trigger:
Preparation
ENC/RGB switch(side panel) "ENC"
OUTPUT/DCC switch(side panel) "CAM/OFF"

Object:

Monitor screen Waveform monitor



AT-58 BOARD (COMPONENT SIDE)

Lens Zoom:

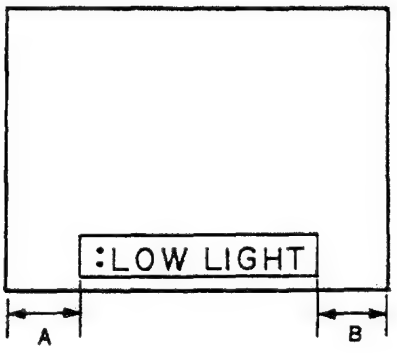
Lens iris: Close "C"

Test point: TEST OUT terminal
Adjust point: ⊘ RV1(CHR SIZE)/AT-58 board

Specification: A = B

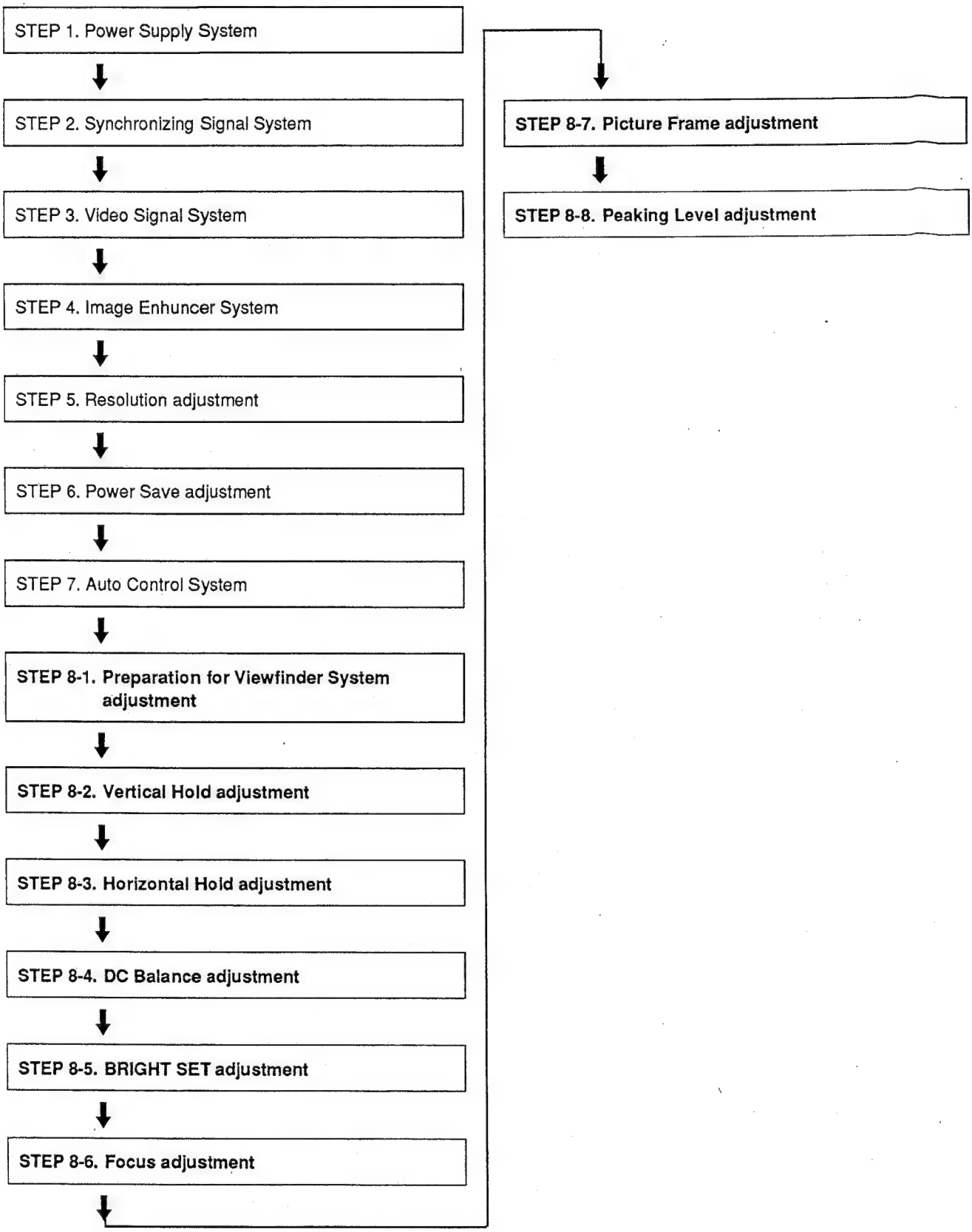
Adjustment procedurs

VF Screen



Note:

STEP 8. VIEWFINDER SYSTEM

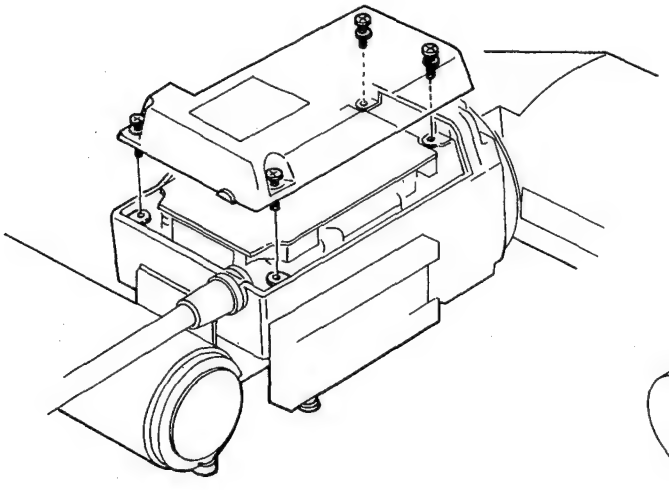


STEP 8-1. Preparation for Viewfinder System adjustment

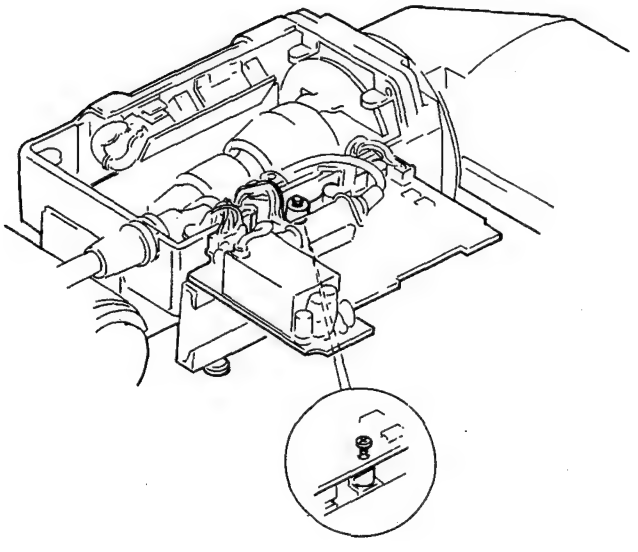
Note: *Be sure to adjust the camera completely, or the following adjustments will become invalid.*

Preparation

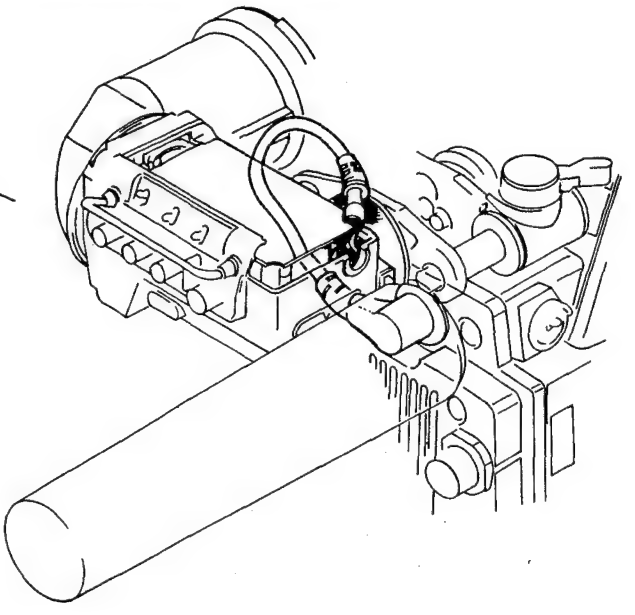
1. Set the power of AC adaptor(AC-500CE or CMA-8CE) to "OFF".
2. Remove the viewfinder from the camera and remove the VF cover.



3. Install the viewfinder to be turned upside shown on the camera.



4. Turn the component side of VF-41 board up wards for adjustments as shown below.



5. Set the power switch of AC adaptor(AC-500CE or CMA-8CE) to "ON".

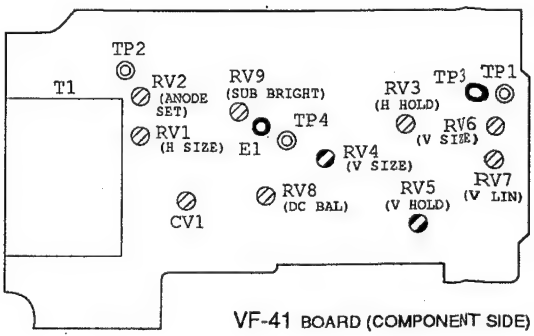
STEP 8-2. Vertical Hold adjustment

Note:

Equipment: Oscilloscope
To be extended:
Trigger:
Preparation
1. Pull the EN-69P board out of the camera.
2. Set ◓RV4(V SIZE)/VF-41 board to the mechanical center unless it is marked.

Object:

Monitor screen Waveform monitor



VF-41 BOARD (COMPONENT SIDE)

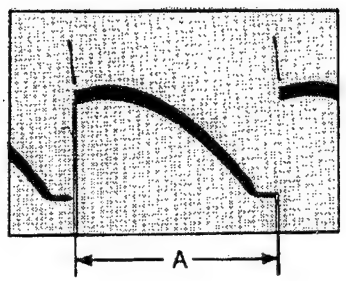
Lens Zoom:

Lens iris:

Test point: TP3(GND:E1)/VF-41 board
Adjust point: ◓RV5(V HOLD)/VF-41 board

Specification: A = 25.6 ± 0.5msec

Adjustment procedures



Note: After this adjustment is completed, insert the EN-69P board into the camera.

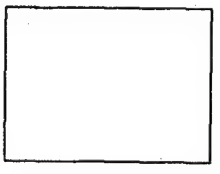
STEP 8-3. Horizontal Hold adjustment

Note:

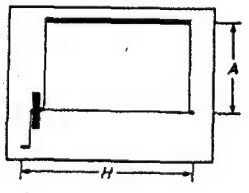
Equipment: Oscilloscope,Waveform monitor(WFM)
To be extended:
Trigger: CH2/oscilloscope
Preparation

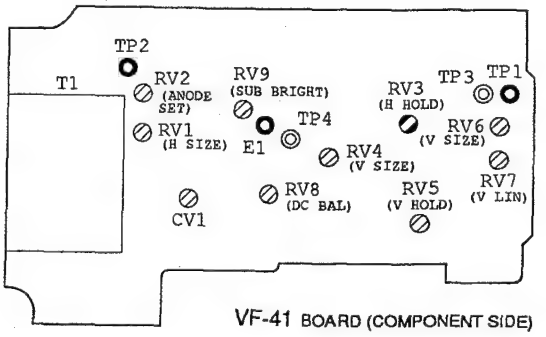
Object: White window chart

Monitor screen



Waveform monitor



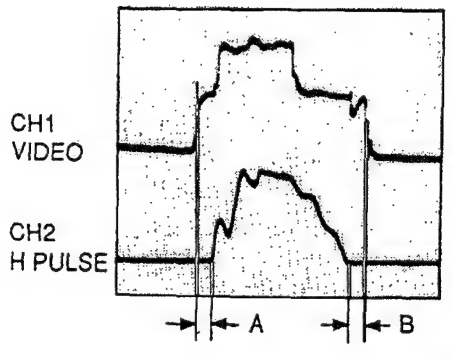


VF-41 BOARD (COMPONENT SIDE)

Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: CH1 TP2(GND:E1)/VF-41 board
CH2 TP1(GND:E1)/VF-41 board
Adjust point: ◐RV3(H HOLD)/VF-41 board

Specification:

Adjustment procedures



A=B

Note:

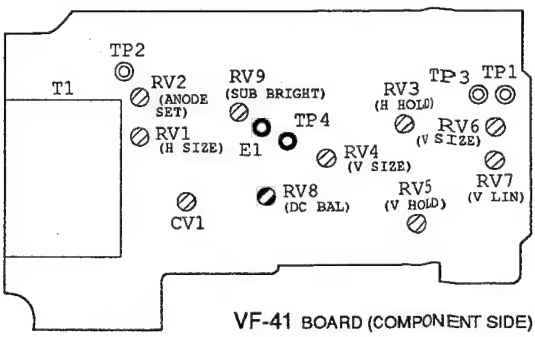
STEP 8-4. DC Balance adjustment

Note:

Equipment: Oscilloscope
To be extended:
Trigger:
Preparation
CAM/BARS switch(camera side)"BARS"

Object:

Monitor screen Waveform monitor



VF-41 BOARD (COMPONENT SIDE)

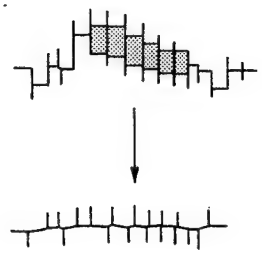
Lens Zoom:

Lens iris:

Test point: TP4(GND:E1)/VF-41 board
Adjust point: RV8(DC BALANCE)/VF-41 board

Specification: mentioned below

Adjustment procedures



Only spike noises should appear at TP4.

Note:

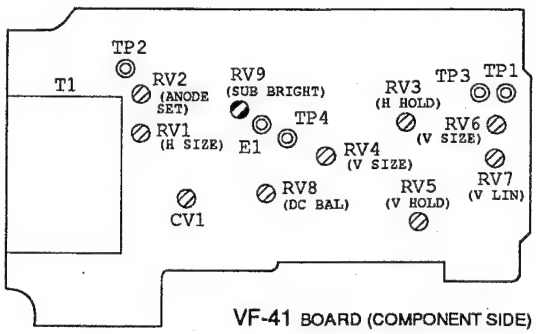
STEP 8-5. BRIGHT SET adjustment

Note:

Equipment: Viewfinder screen
To be extended:
Trigger:
Preparation
OUTPUT/DCC switch(camera side)"BARS/OFF"
BRIGHT control(viewfinder) "fully clockwise"
CONTRAST control(viewfinder) "fully clockwise"

Object:

Monitor screen Waveform monitor



VF-41 BOARD (COMPONENT SIDE)

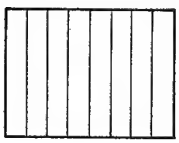
Lens Zoom:

Lens iris:

Test point: TEST OUT terminal
Adjust point: ◐RV9(BRIGHT SET)/VF-41 board

Specification: mentioned below

Adjustment procedures
Adjust so that the darkest color-bar signal portion is light slightly.



Note:

STEP 8-6. Focus adjustment

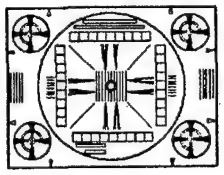
Note: STEP 8-7.Picture Frame adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are satisfied.

Equipment: Viewfinder screen
To be extended:
Trigger:
Preparation

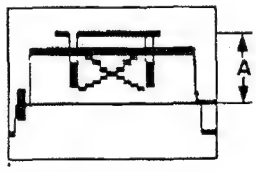
BRIGHT control(viewfinder)	"mechanical center"
CONTRAST control(viewfinder)	"fully clockwise"
PEAKING control(viewfinder)	"fully counterclockwise"

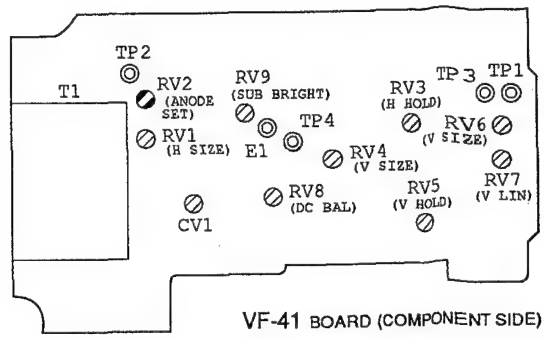
Object: Resolution chart

Monitor screen



Waveform monitor





VF-41 BOARD (COMPONENT SIDE)

Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: ◐RV2(FOCUS)/VF-41 board

Specification: mentioned below

Adjustment procedures
Turn ◐RV2(FOCUS)/VF-41 board from the leftmost position clockwise slowly until the picture on the viewfinder is best focused.
(Note: turn slowly.)

Note: After this adjustment is completed, confirm that a focus can be achieved regardless of positions where the BRIGHT and CONTRAST control are set.

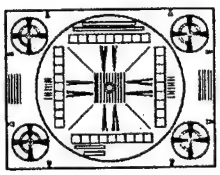
STEP 8-7. Picture Frame adjustment

Note: STEP 8-6.Focus adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are satisfied.

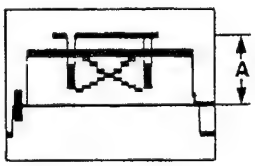
Equipment: Viewfinder screen
To be extended:
Trigger:
Preparation
Remove the eye cap from the viewfinder.
BRIGHT control(viewfinder) "mechanical center"
CONTRAST control(viewfinder) "mechanical center"
PEAKING control(viewfinder) "mechanical center"

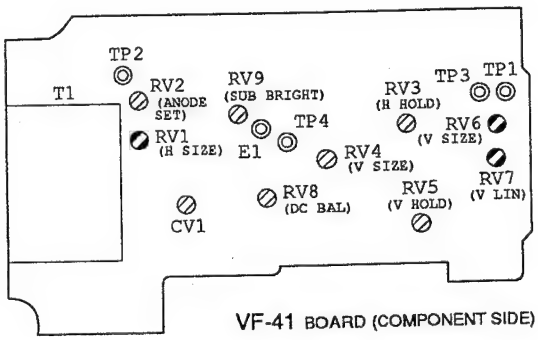
Object: Resolution chart

Monitor screen



Waveform monitor





VF-41 BOARD (COMPONENT SIDE)

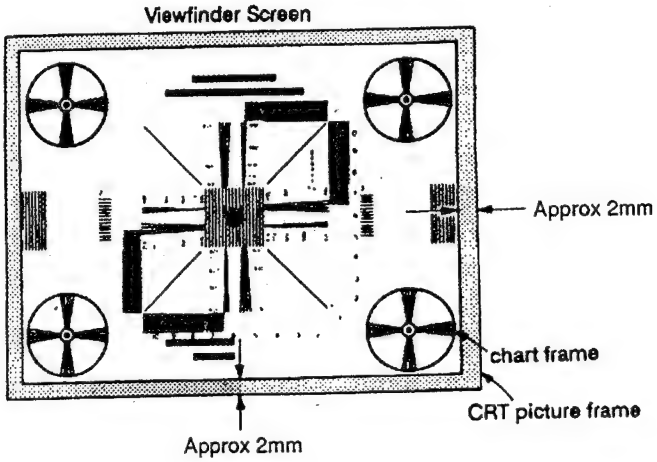
Lens Zoom: Underscanned picture frame on the monitor = chart frame
Lens iris: A = 700 ± 10mV (at TEST OUT terminal)
Test point: TEST OUT terminal
Adjust point: mentioned below

Specification: mentioned below

Adjustment procedures

1. Adjust ⊘RV7(V LIN)/VF-41 board so that the distortion of each circle at the four corners of resolution chart is minimized.
2. Adjust ⊘RV1(H SIZE)/VF-41 board so that the H size of resolution chart is underscanned by approx. 2mm from the CRT picture frame.
3. Adjust ⊘RV6(V SIZE)/VF-41 board so that the V size of resolution chart is underscanned by approx. 2mm from the CRT picture frame.
4. Adjust the centering magnet of the deflection coil so that the center of resolution chart is located at the center of viewfinder screen.
5. Adjust the centering magnet of the deflection coil so that the resolution chart is located in the center of viewfinder screen.
6. Repeat item 1 to item 5 until the specification are satisfied.

Viewfinder Screen



Note:

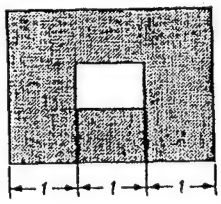
STEP 8-8. Peaking Adjustment

Note:

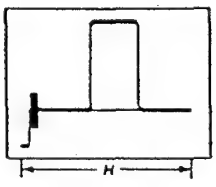
Equipment: Waveform monitor(WFM)
To be extended:
Trigger:
Preparation
Remove the eye cap from the viewfinder.
PEAKING control(viewfinder) "Return about 10 degrees to counterclockwise from the rightmost position."
BRIGHT control(viewfinder) "mechanical center"
CONTRAST control(viewfinder) "mechanical center"

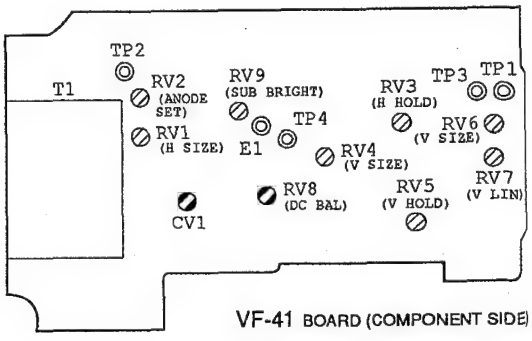
Object: White window chart

Monitor screen



Waveform monitor





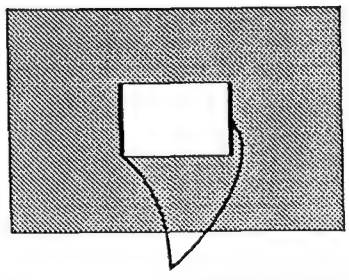
VF-41 BOARD (COMPONENT SIDE)

Lens Zoom: Adjust the zoom control and shoot the white window chart as shown above.
Lens iris: A = 350 ±10mV (at TEST OUT terminal)
Test point: The picture on the viewfinder

Specification: mentioned below

Adjustment procedures
Make the peaks of the edges equal by adjusting the ⊘CV1/VF-41 board and the ⊘ RV8/VF-41 board together.

View finder



The peak level at edges should be the same.

Note:

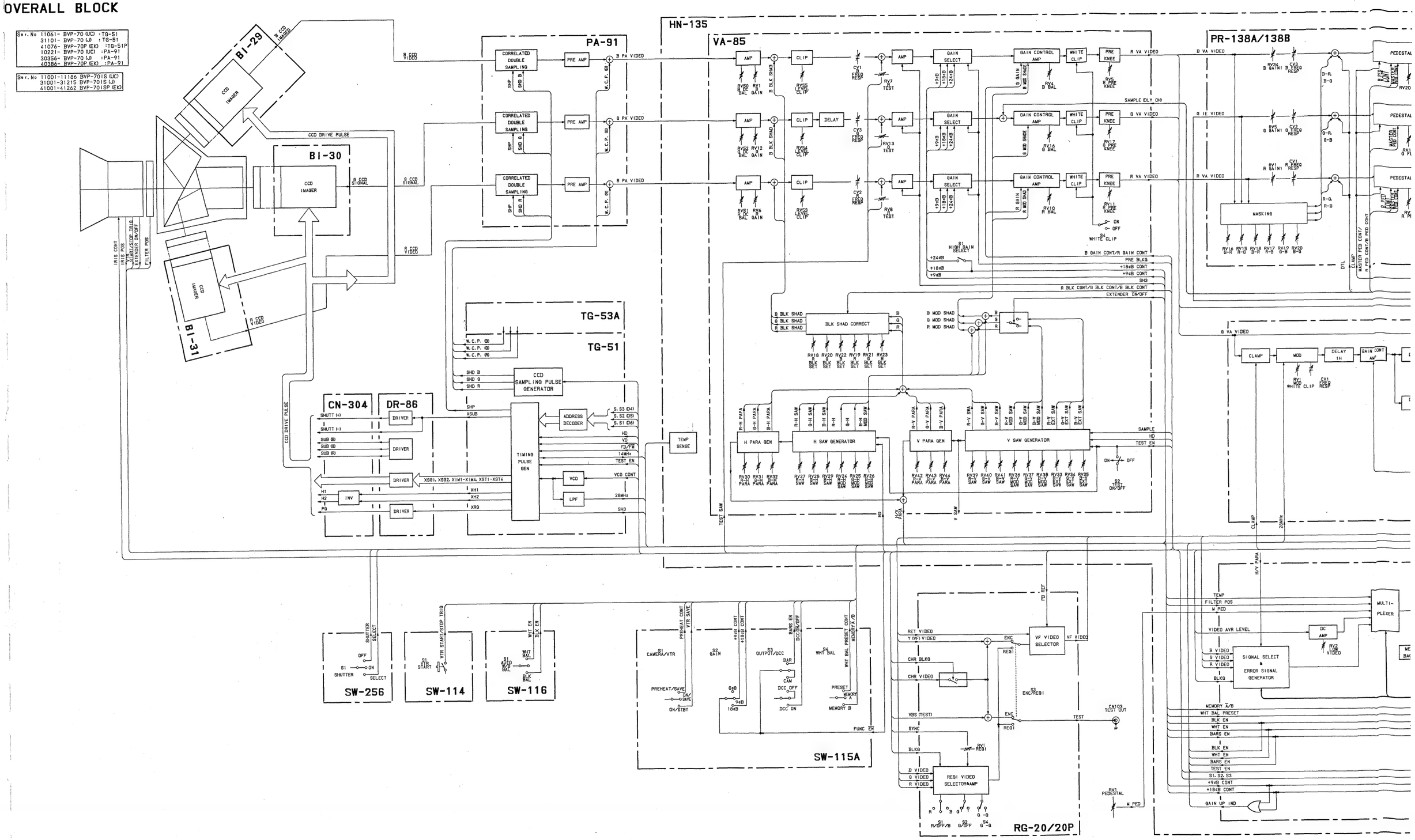
OVERALL BLOCK OVERALL BLOCK

SECTION A
BLOCK DIAGRAMS

OVERALL BLOCK

Ser.No 11061- BVP-70 (UC) :TG-51
31101- BVP-70 (J) :TG-51
41076- BVP-70P (EK) :TG-51P
10221- BVP-70 (UC) :PA-91
30356- BVP-70 (J) :PA-91
40386- BVP-70P (EK) :PA-91

Ser.No 11001-11186 BVP-701S (UC)
31001-31215 BVP-701S (J)
41001-41262 BVP-701SP (EK)



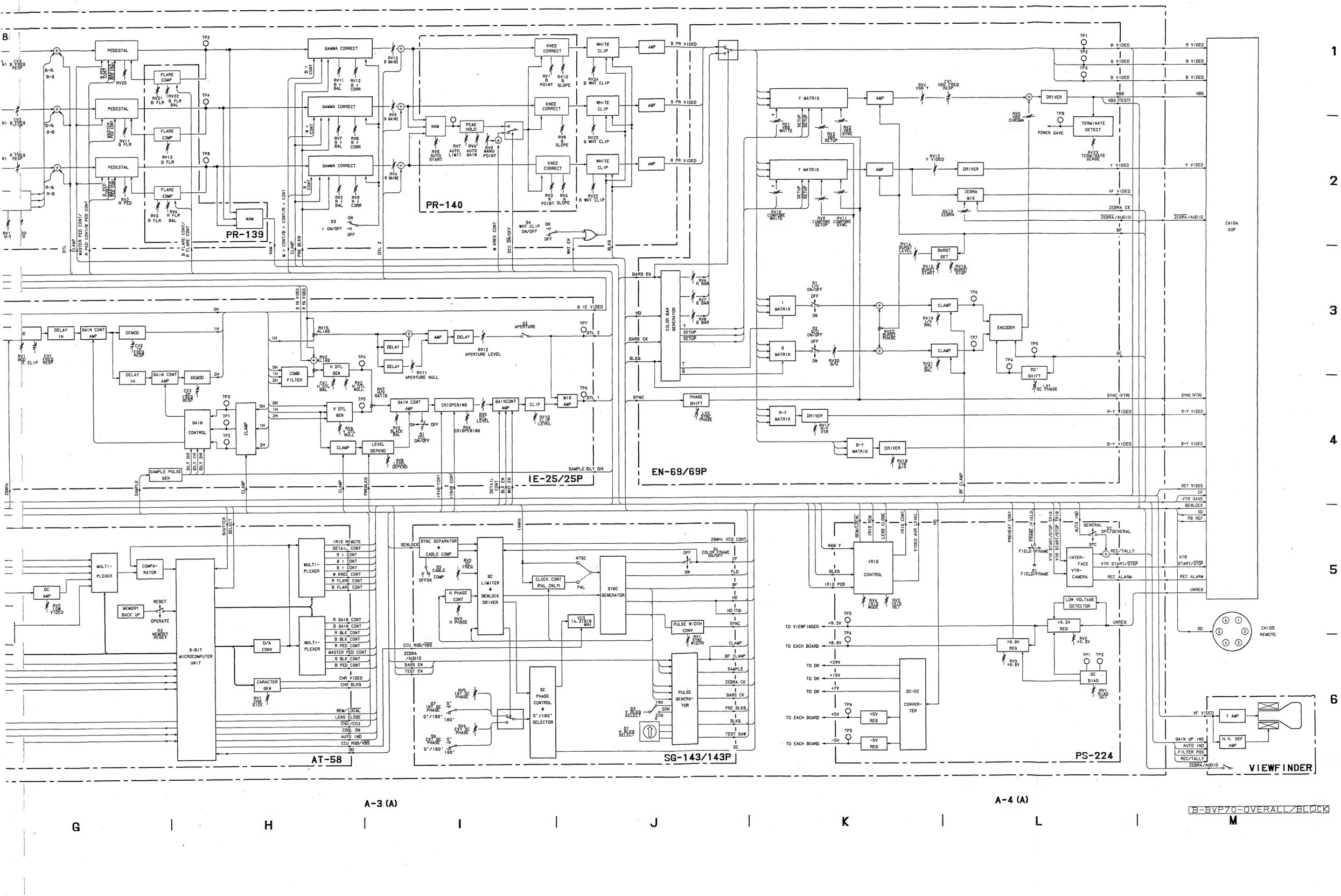
BVP-70 (J, UC)
BVP-70P (EK)

A-1 (A) A-2 (A)

A | B | C | D | E | F | G

OVERALL BLOCK

OVERALL BLOCK



A-3 (A)

A-4 (A)

B-BVP70-OVERALL/BLOCK

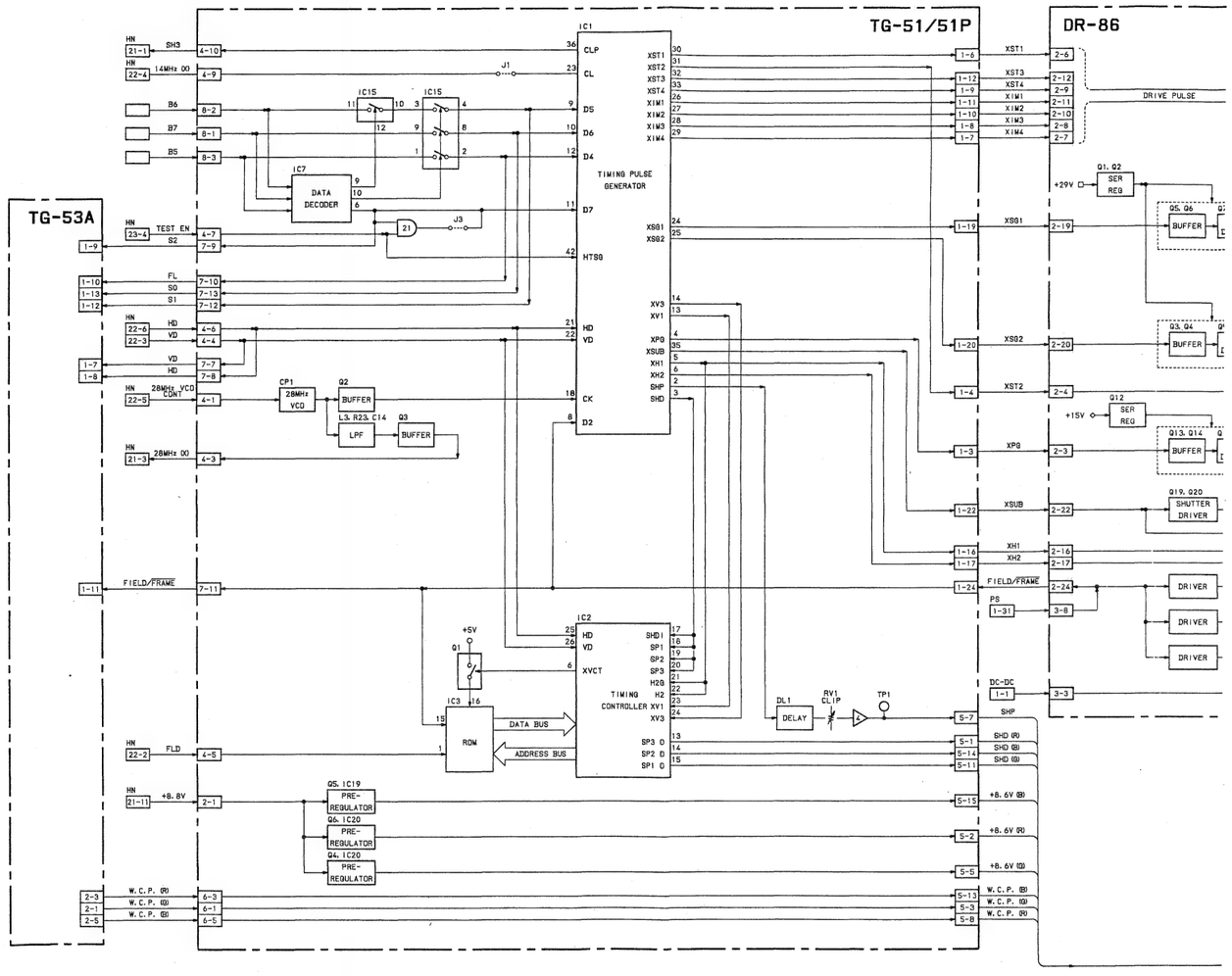
CCD BLOCK

CCD BLOCK

TG-51/51P Board

*Ser.No		
11061-	BVP-70	(UC)
31101-	BVP-70	(J)
41076-	BVP-70P	(EK)

Ser.No		
11001-11186	BVP-701S	(UC)
31001-31215	BVP-701S	(J)
41001-41262	BVP-701SP	(EK)



A-5 (A)

A-6 (A)

B-BVP70-CCD/BLOCK

A | B | C | D | E | F | G

CCD BLOCK CCD BLOCK

PA-91 Board

Ser. No	
10221-	BVP-70 (UC)
30356-	BVP-70 (J)
40386-	BVP-70P (EK)

Ser. No	
11001-11186	BVP-701S (UC)
31001-31215	BVP-701S (J)
41001-41262	BVP-701SP (EK)

DR-86

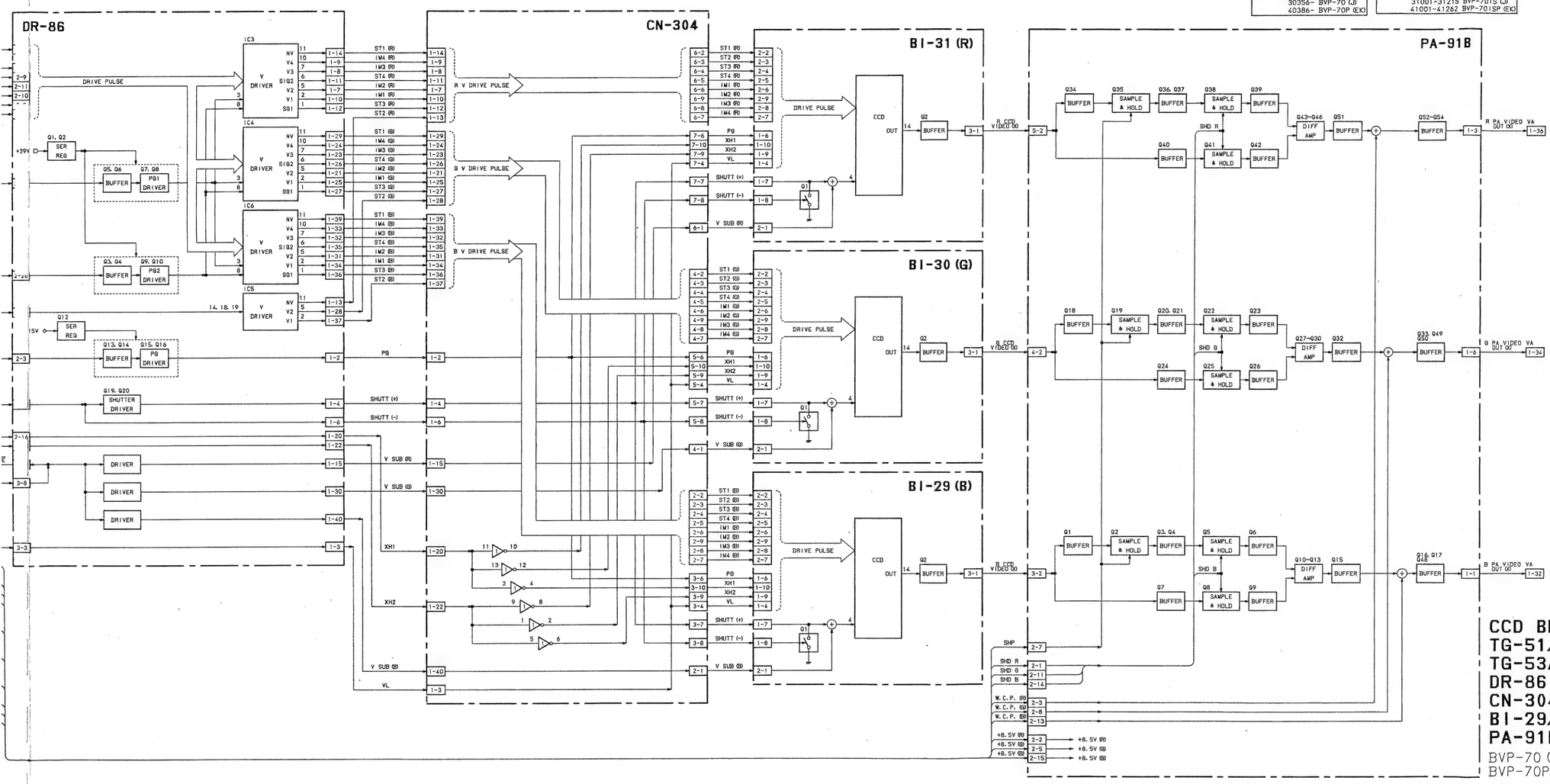
CN-304

BI-31 (R)

BI-30 (G)

BI-29 (B)

PA-91B



CCD BLOCK
TG-51/51P BLOCK
TG-53A BLOCK
DR-86 BLOCK
CN-304 BLOCK
BI-29/30/31 BLOCK
PA-91B BLOCK

BVP-70 (J, UC)
BVP-70P (EK)

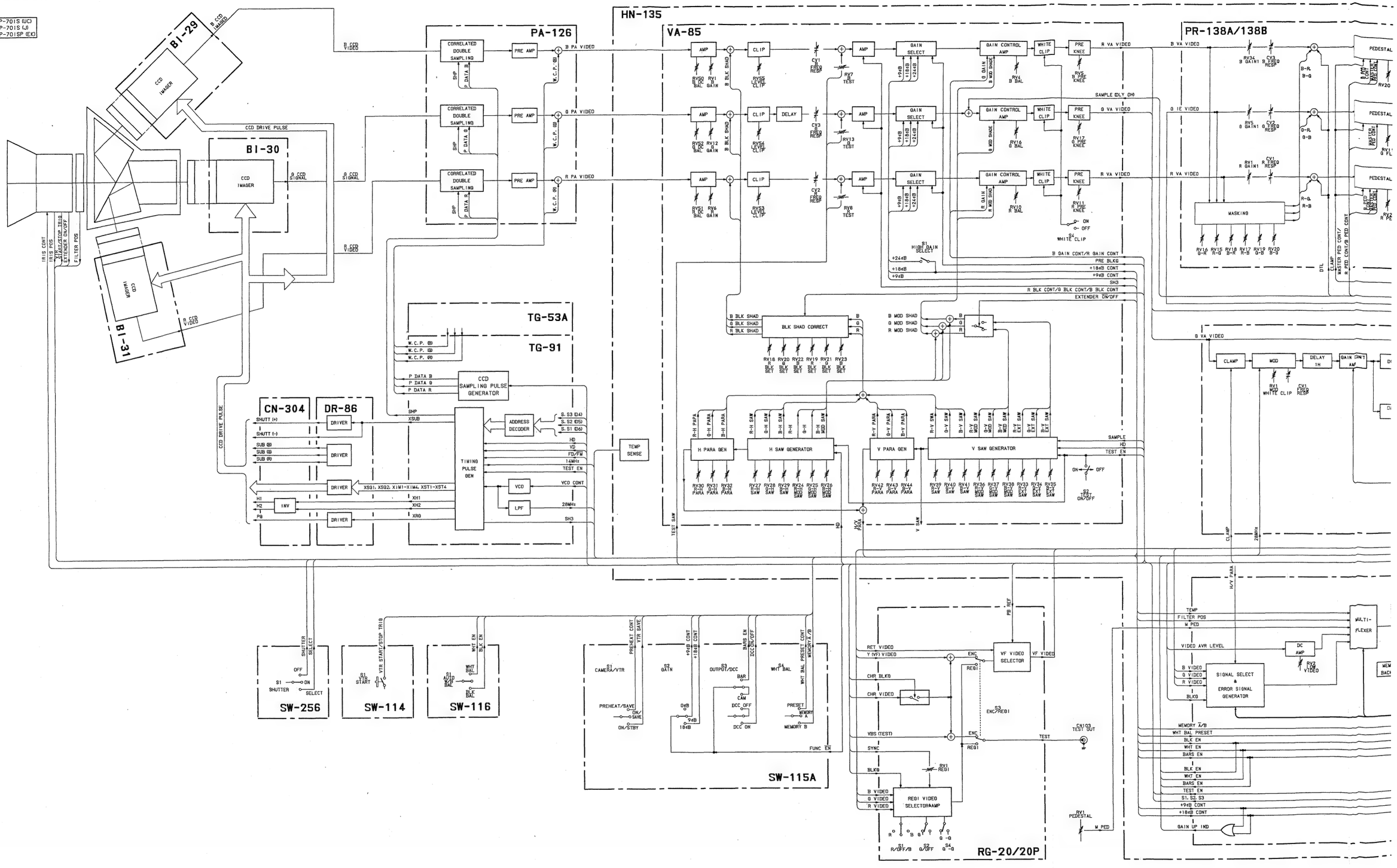
A-7 (A) A-8 (A)

G H I J K L M

BVP-70 (J, UC)
BVP-70P (EK)

OVERALL BLOCK

Ser. No 11187- BVP-701S (UC)
31216- BVP-701S (J)
41263- BVP-701SP (EK)



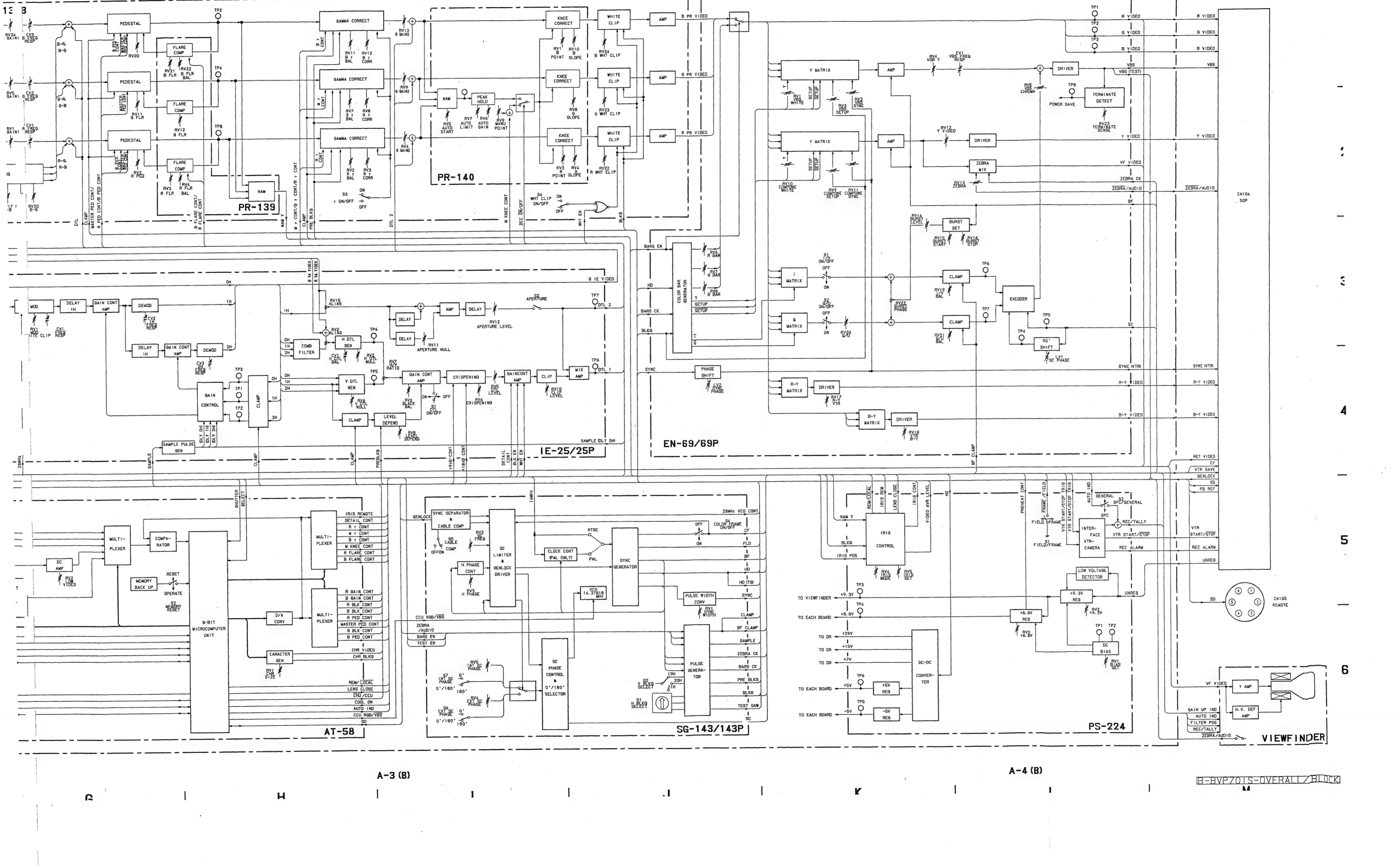
BVP-701S (J, UC)
BVP-701SP (EK)

A-1 (B)

A-2 (B)

A | B | C | D | E | F | G

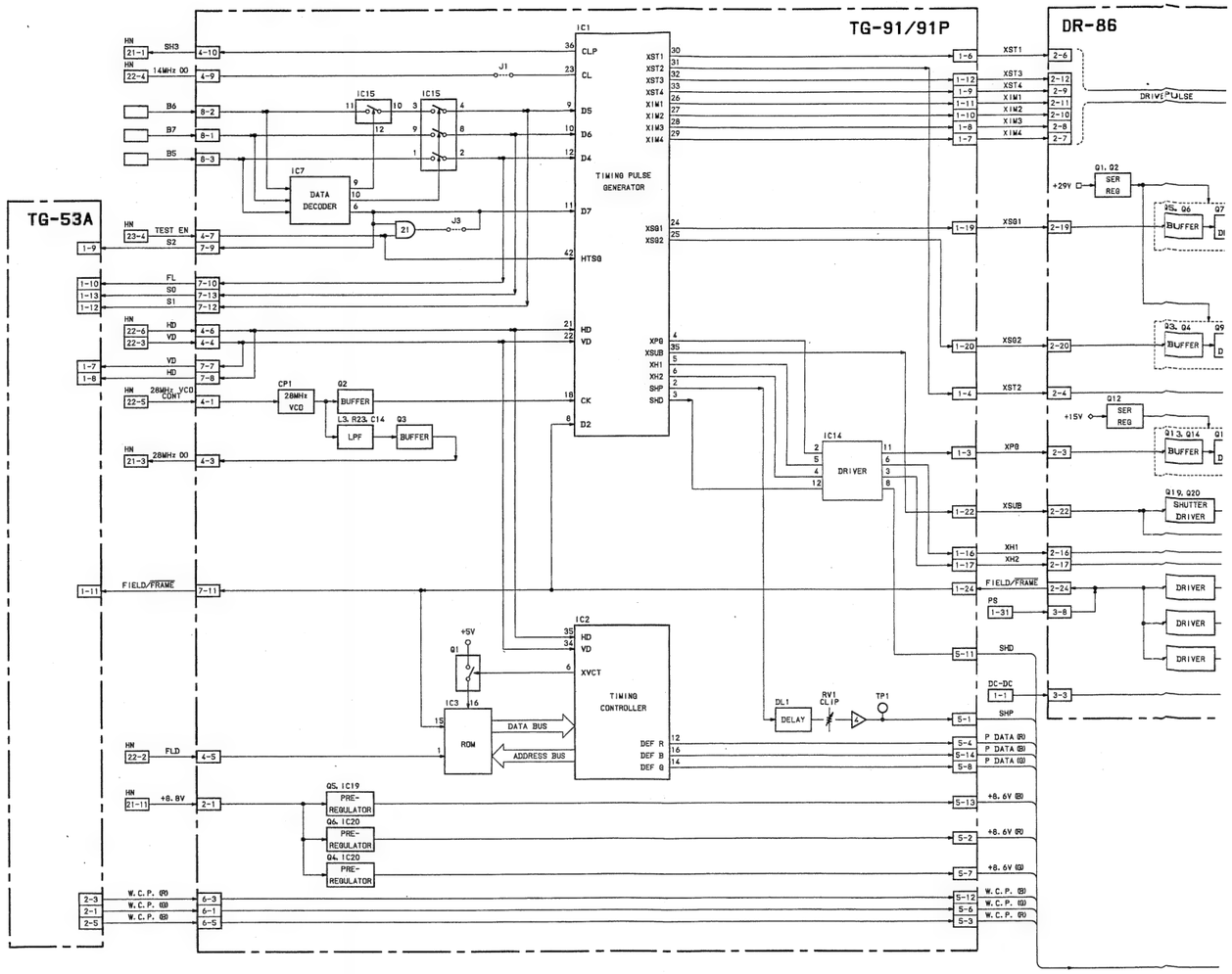
OVERALL BLOCK OVERALL BLOCK



CCD BLOCK

CCD BLOCK

Ser.No 11187- BVP-701S (JC)
31216- BVP-701S (J)
41263- BVP-701SP (EK)



A-5 (B)

A-6 (B)

B-BVP701S-CCD/BLOCK

CCD BLOCK CCD BLOCK

DR-86

CN-304

BI-31 (R)

BI-30 (G)

BI-29 (B)

PA-126

CCD BLOCK
TG-91/91P BLOCK
TG-53A BLOCK
DR-86 BLOCK
CN-304 BLOCK
BI-29/30/31 BLOCK
PA-126 BLOCK
BVP-701S (J, UC)
BVP-701SP (EK)

A-7 (B)

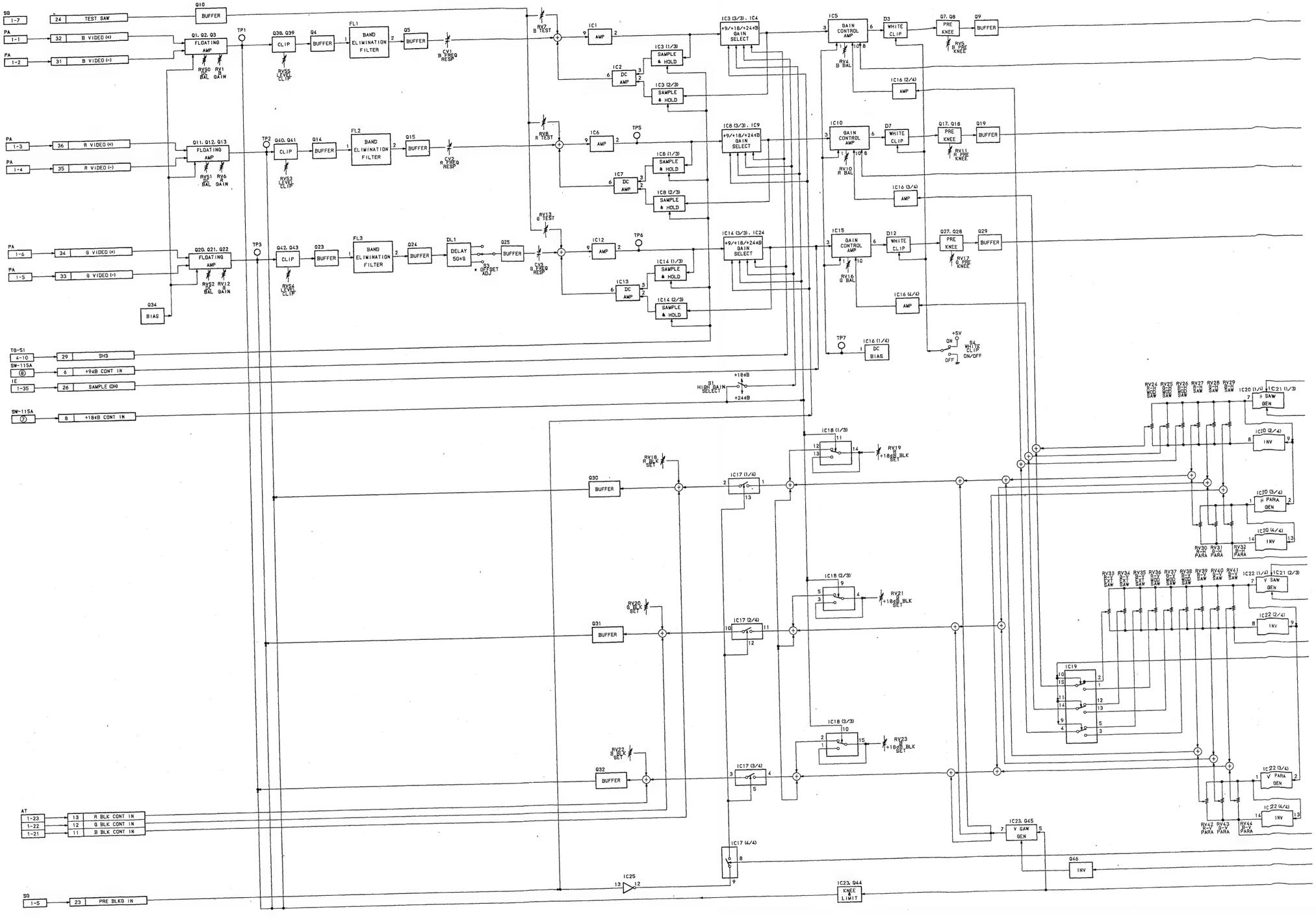
A-8 (B)

BVP-701S (J, UC)
BVP-701SP (EK)

G H I J K L M

VA-85 BLOCK

VA-85 BLOCK

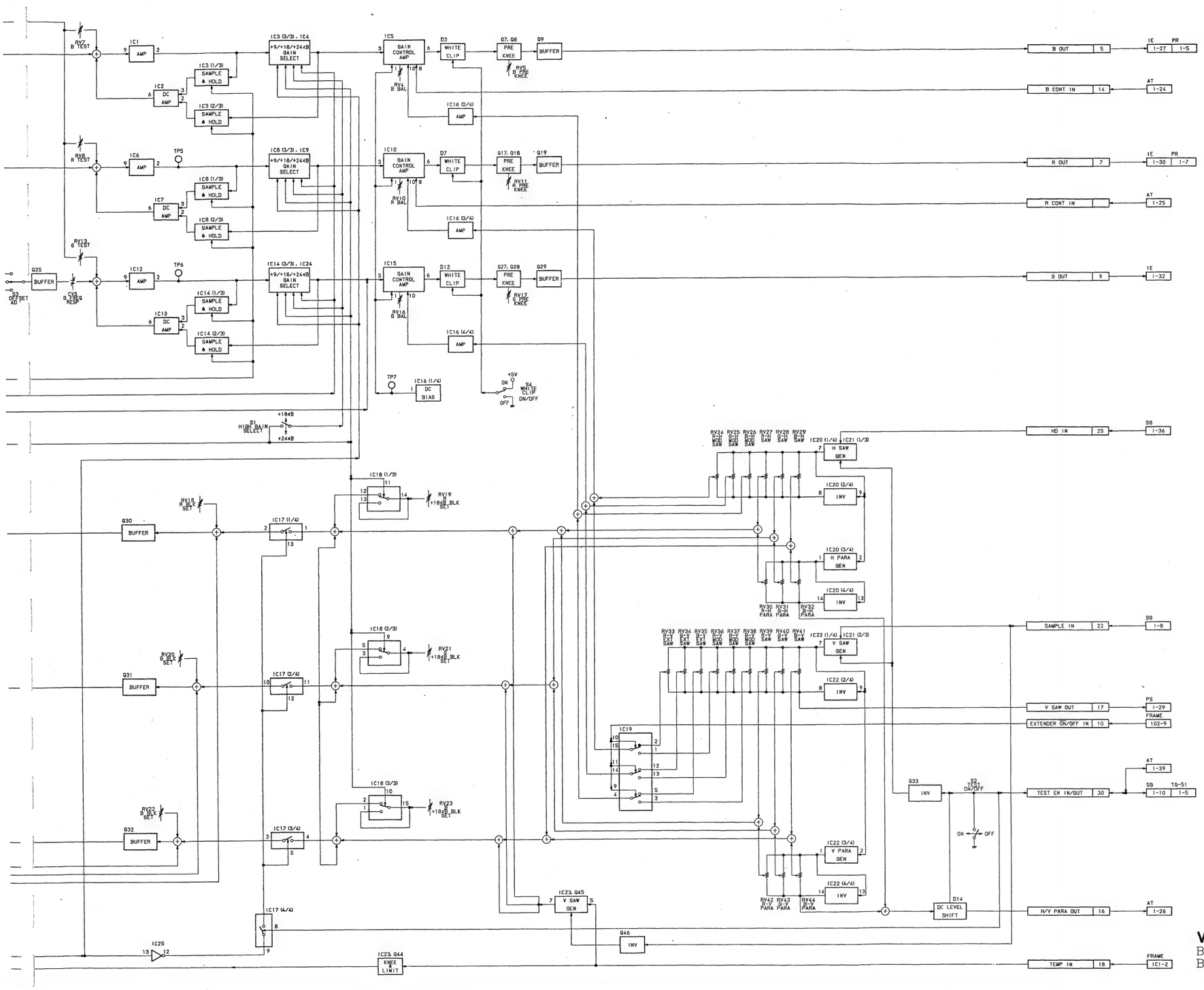


A-9 A-10

BVP-70 (J, UC)
BVP-70P (EK)

A | B | C | D | E | F | G

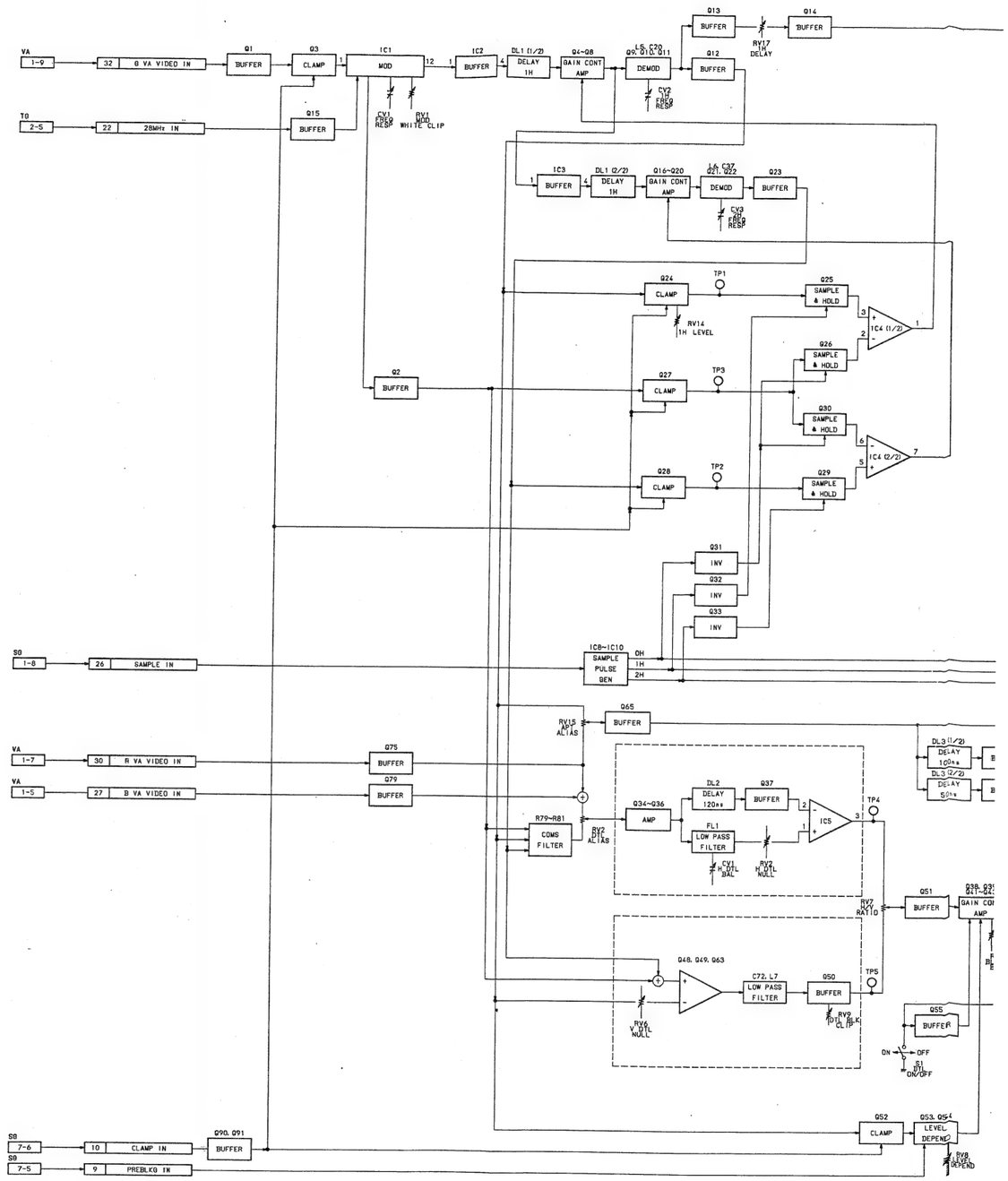
VA-85 BLOCK



VA-85 BLOCK

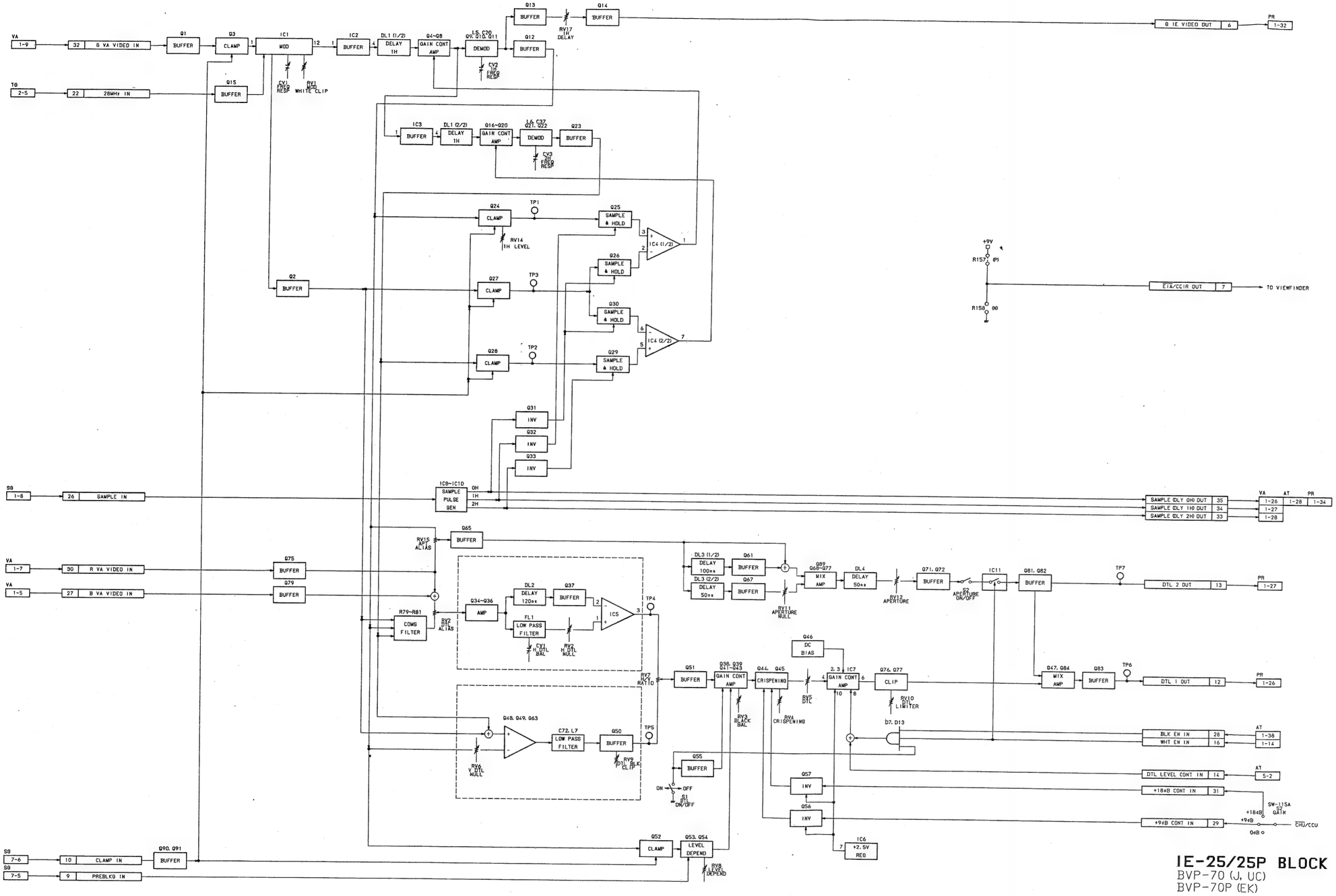
BVP-70 (J, UC)
BVP-70P (EK)

IE-25/25P BLOCK



IE-25/25P BLOCK

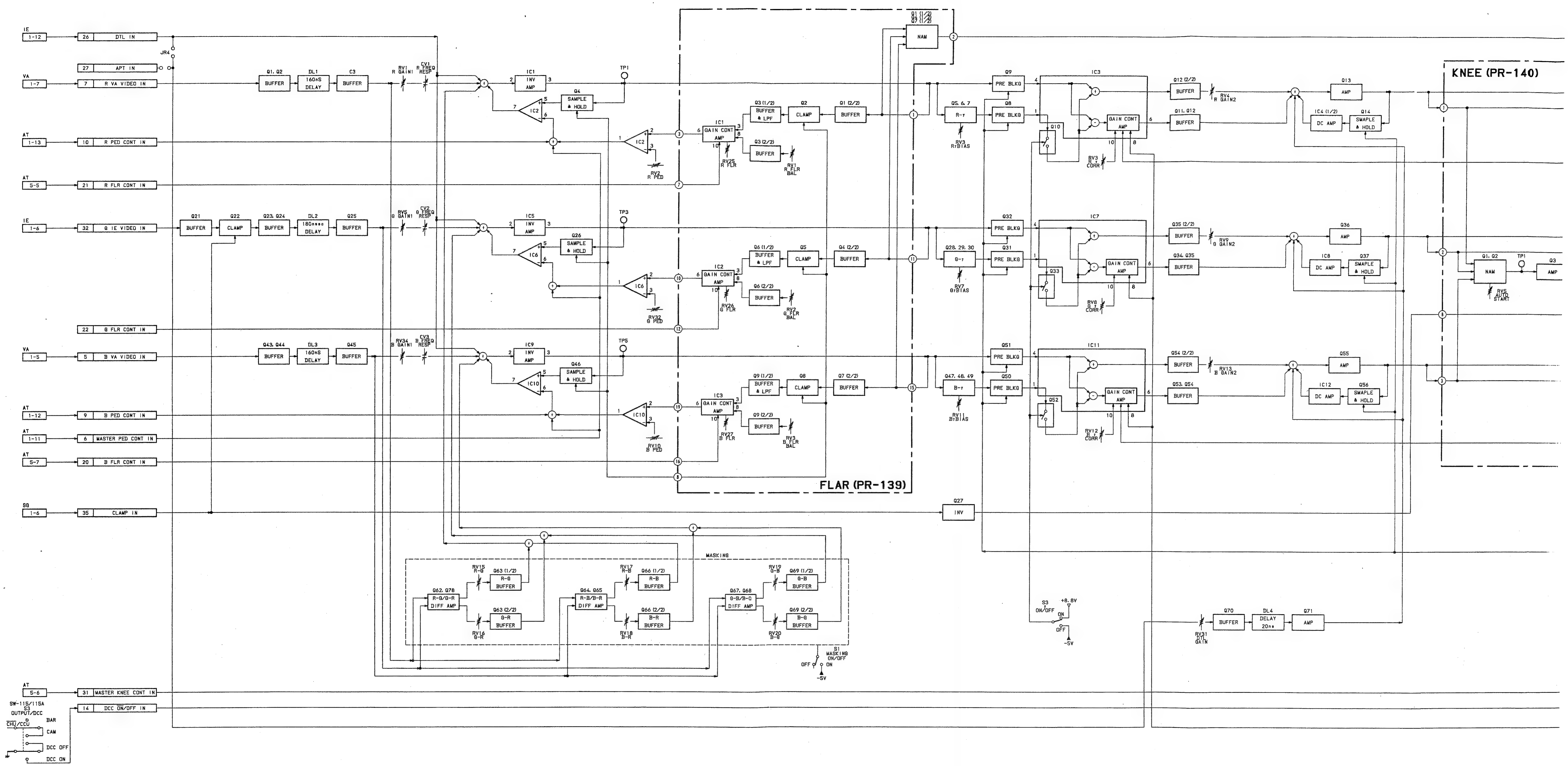
IE-25/25P BLOCK

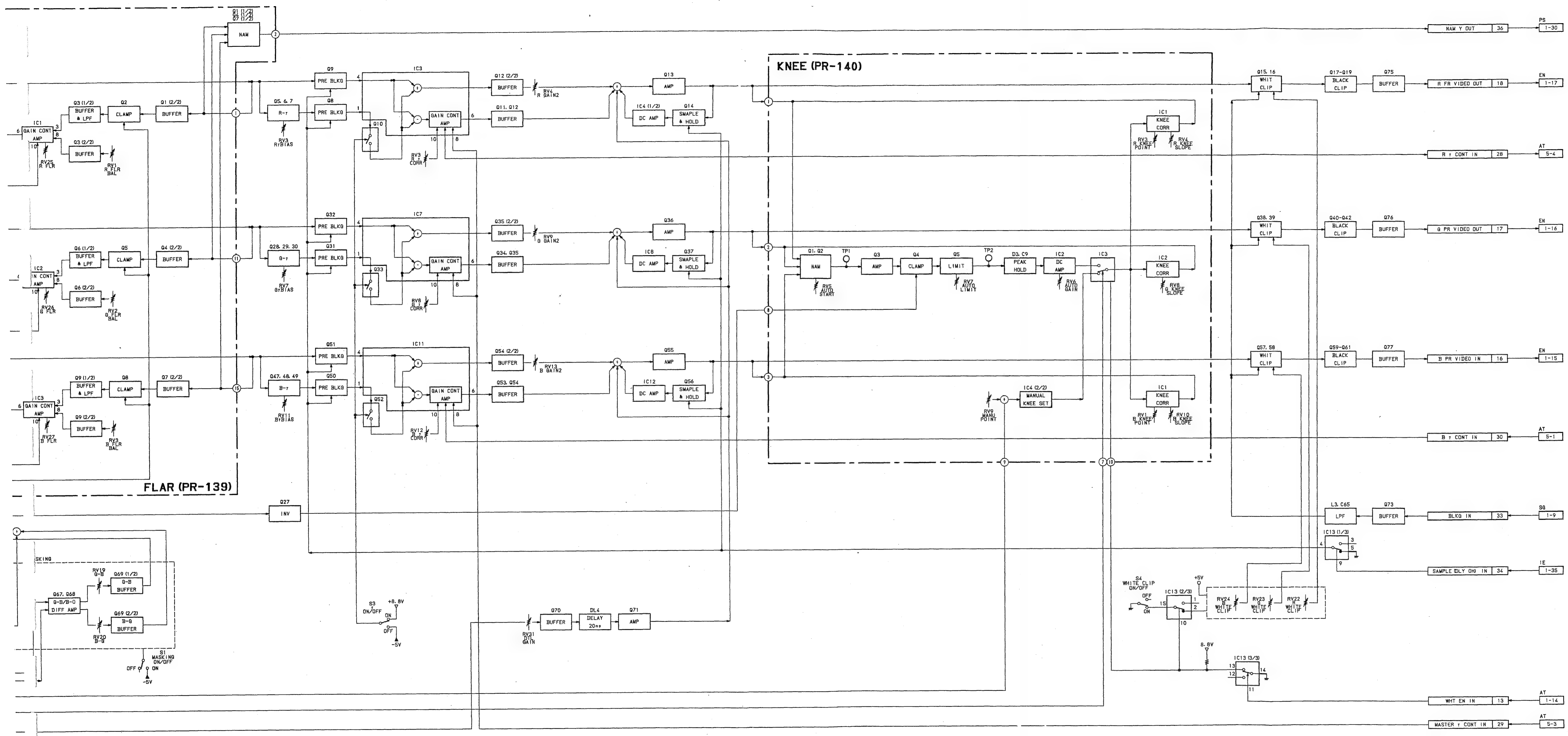


IE-25/25P BLOCK

BVP-70 (J, UC)
BVP-70P (EK)

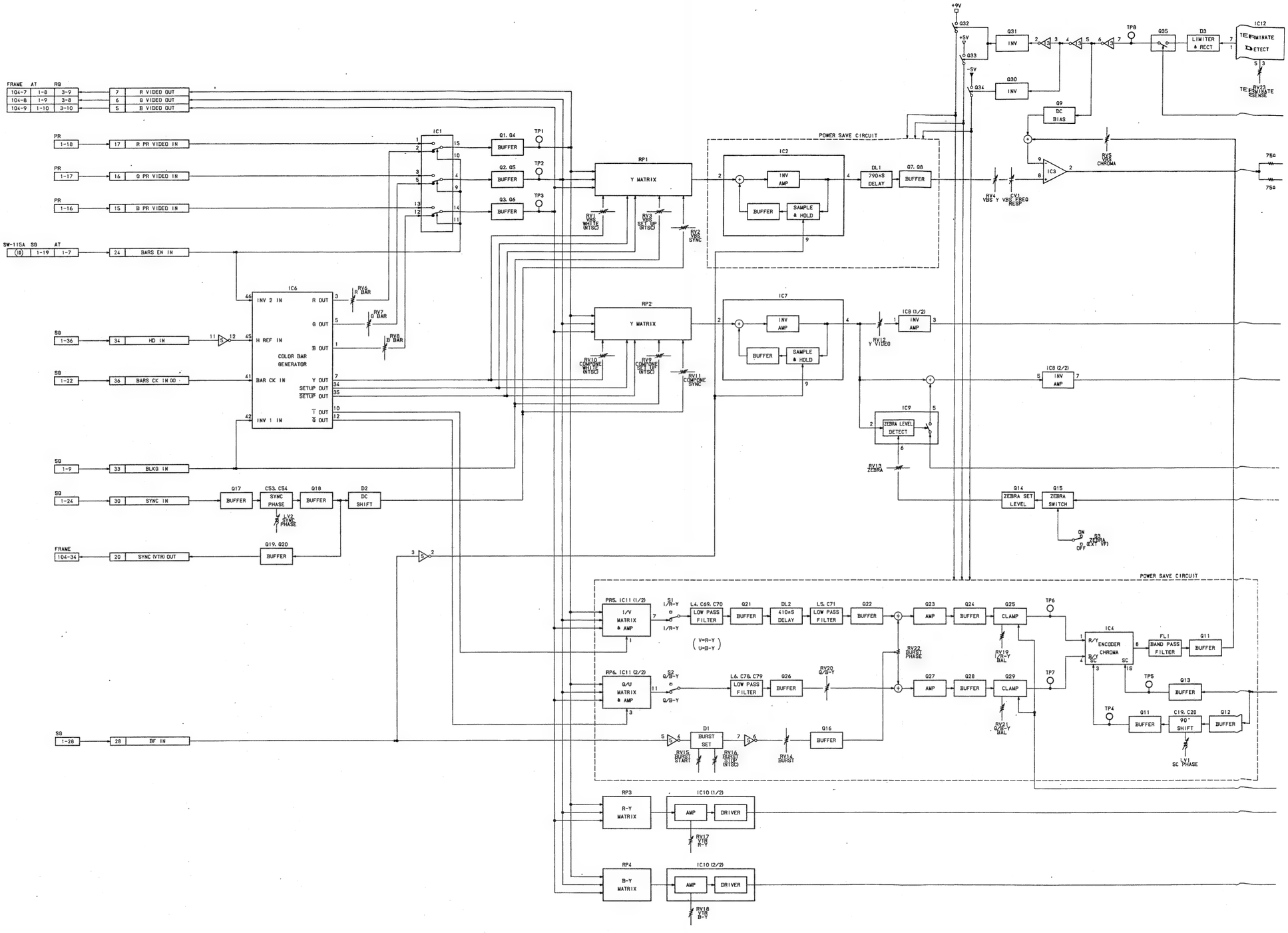
PR-138 BLOCK

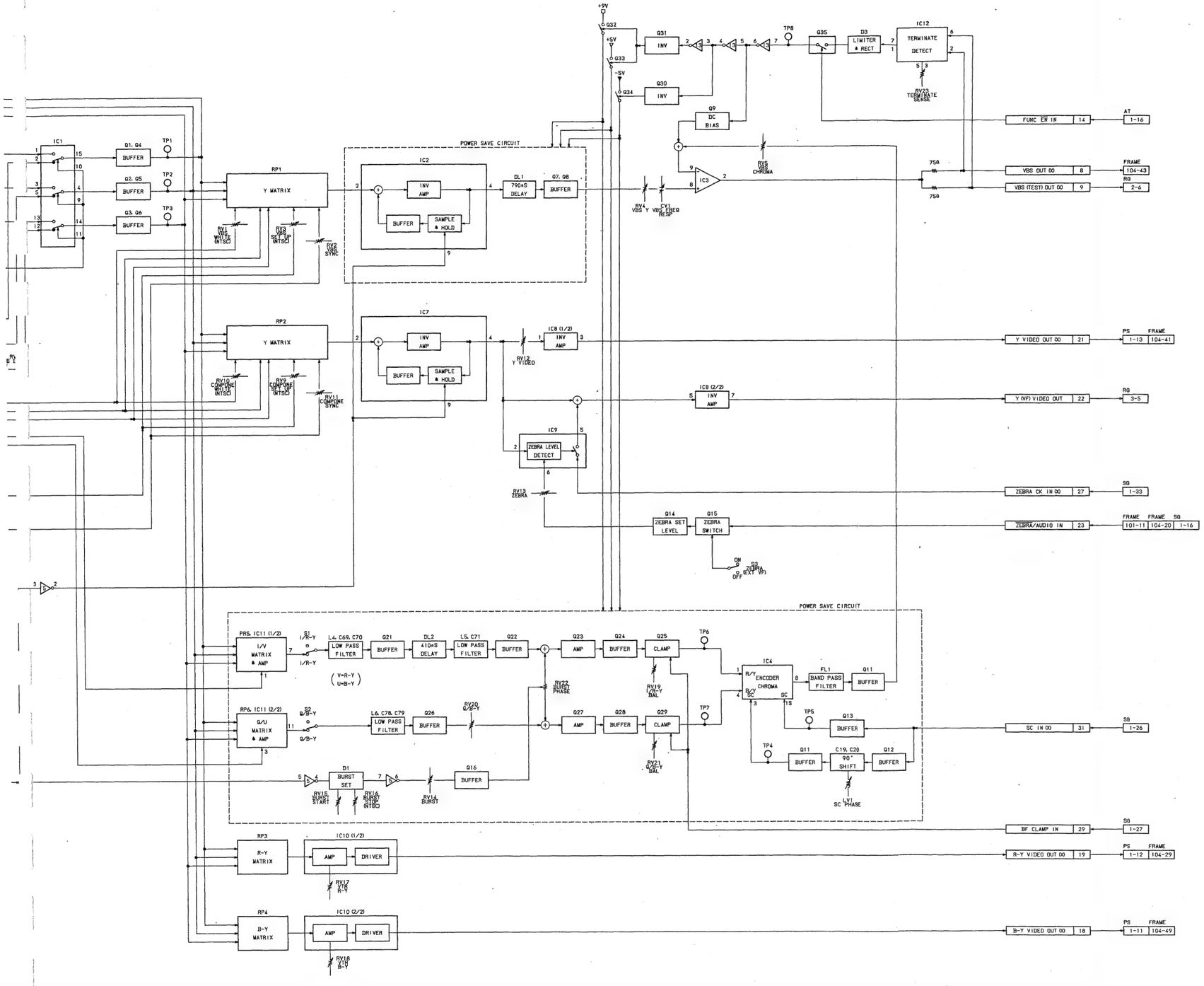

DTL IN
APT IN
R VA VIDEO IN
R PED CONT IN
R FLR CONT IN
G IE VIDEO IN
G FLR CONT IN
B VA VIDEO IN
B PED CONT IN
MASTER PED CONT IN
B FLR CONT IN
CLAMP IN
MASTER KNEE CONT IN
DCC ON/OFF IN
BUFFER
CLAMP
DELAY
INV AMP
SAMPLE & HOLD
GAIN CONT AMP
BUFFER & LPF
NAM
PRE BLKG
AMP
DC AMP
SMAPLE & HOLD
DIFF AMP
MASKING
S1 MASKING ON/OFF
S3 ON/OFF
FLAR (PR-139)
KNEE (PR-140)
SW-115/115A S3 OUTPUT/DCC
BAR
CAM
DCC OFF
DCC ON



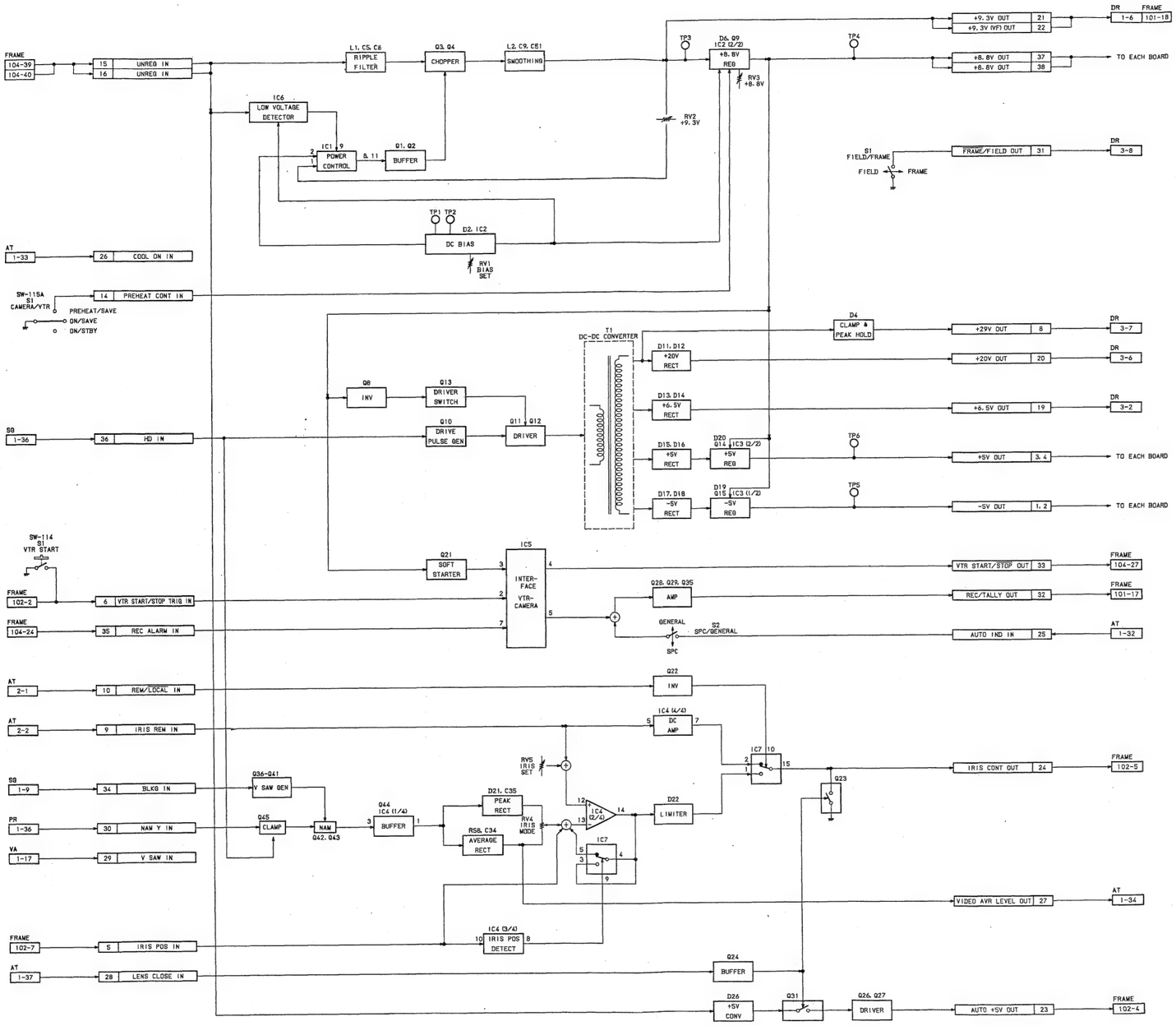
B-BVP70-PR138BLOCK S4

EN-69/69P BLOCK




+9V
+5V
-5V
Q32
Q33
Q34
Q31 INV
Q30 INV
TP8
Q35
D3 LIMITER & RECT
IC12 TERMINATE DETECT
RV23 TERMINATE SENSE
FUNC EN IN 14
AT 1-16
Q9 DC BIAS
RV5 VBS CHROMA
IC3
75Ω
VBS OUT 00 8
FRAME 104-43
VBS (TEST) OUT 00 9
RG 2-6
RV4 VBS Y
CV1 VBS FREQ RESP
POWER SAVE CIRCUIT
IC1
Q1, Q4 BUFFER
Q2, Q5 BUFFER
Q3, Q6 BUFFER
TP1
TP2
TP3
RP1 Y MATRIX
RV1 VBS WHITE (NTSC)
RV3 VBS SET UP (NTSC)
RV2 VBS SYNC
IC2
INV AMP
BUFFER
SAMPLE & HOLD
DL1 790nS DELAY
Q7, Q8 BUFFER
RP2 Y MATRIX
RV10 COMPONE WHITE (NTSC)
RV9 COMPONE SET UP (NTSC)
RV11 COMPONE SYNC
IC7
IC8 (1/2) INV AMP
RV12 Y VIDEO
Y VIDEO OUT 00 21
PS 1-13 FRAME 104-41
IC8 (2/2) INV AMP
Y (VF) VIDEO OUT 22
RG 3-5
IC9 ZEBRA LEVEL DETECT
RV13 ZEBRA
ZEBRA CK IN 00 27
SG 1-33
Q14 ZEBRA SET LEVEL
Q15 ZEBRA SWITCH
ZEBRA/AUDIO IN 23
FRAME 101-11 FRAME 104-20 SG 1-16
S3 ZEBRA (EXT VF)
POWER SAVE CIRCUIT
PRS. IC11 (1/2) I/V MATRIX & AMP
S1 I/R-Y
L4, C69, C70 LOW PASS FILTER
Q21 BUFFER
DL2 410nS DELAY
L5, C71 LOW PASS FILTER
Q22 BUFFER
Q23 AMP
Q24 BUFFER
Q25 CLAMP
TP6
IC4 ENCODER CHROMA
FL1 BAND PASS FILTER
Q11 BUFFER
(V=R-Y U=B-Y)
RV22 BURST PHASE
RV19 R/V-Y BAL
RP6, IC11 (2/2) Q/U MATRIX & AMP
S2 Q/B-Y
L6, C78, C79 LOW PASS FILTER
Q26 BUFFER
RV20 Q/B-Y
Q27 AMP
Q28 BUFFER
Q29 CLAMP
TP7
TP5
Q13 BUFFER
SC IN 00 31
SG 1-26
TP4
Q11 BUFFER
C19, C20 90° SHIFT
Q12 BUFFER
LV1 SC PHASE
D1 BURST SET
Q16 BUFFER
RV15 BURST START
RV16 BURST SYNC (NTSC)
RV14 BURST
RV21 Q/B-Y BAL
BF CLAMP IN 29
SG 1-27
RP3 R-Y MATRIX
IC10 (1/2) AMP DRIVER
RV17 Y/R-Y
R-Y VIDEO OUT 00 19
PS 1-12 FRAME 104-29
RP4 B-Y MATRIX
IC10 (2/2) AMP DRIVER
RV18 Y/B-Y
B-Y VIDEO OUT 00 18
PS 1-11 FRAME 104-49

PS-224 BOARD



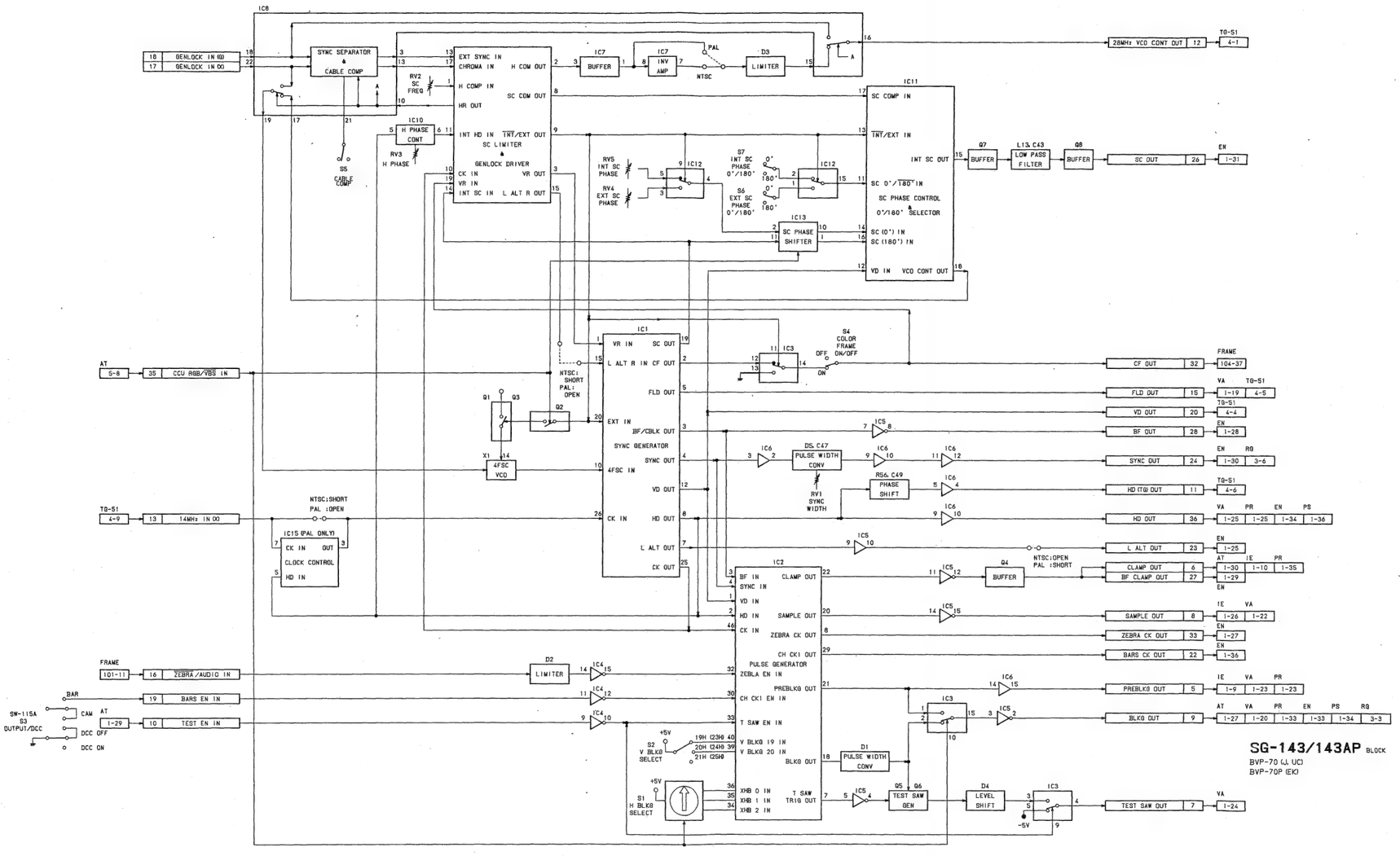
1 2 3 4 5 6

BVP-70 (J, UC)
BVP-70P (EK)

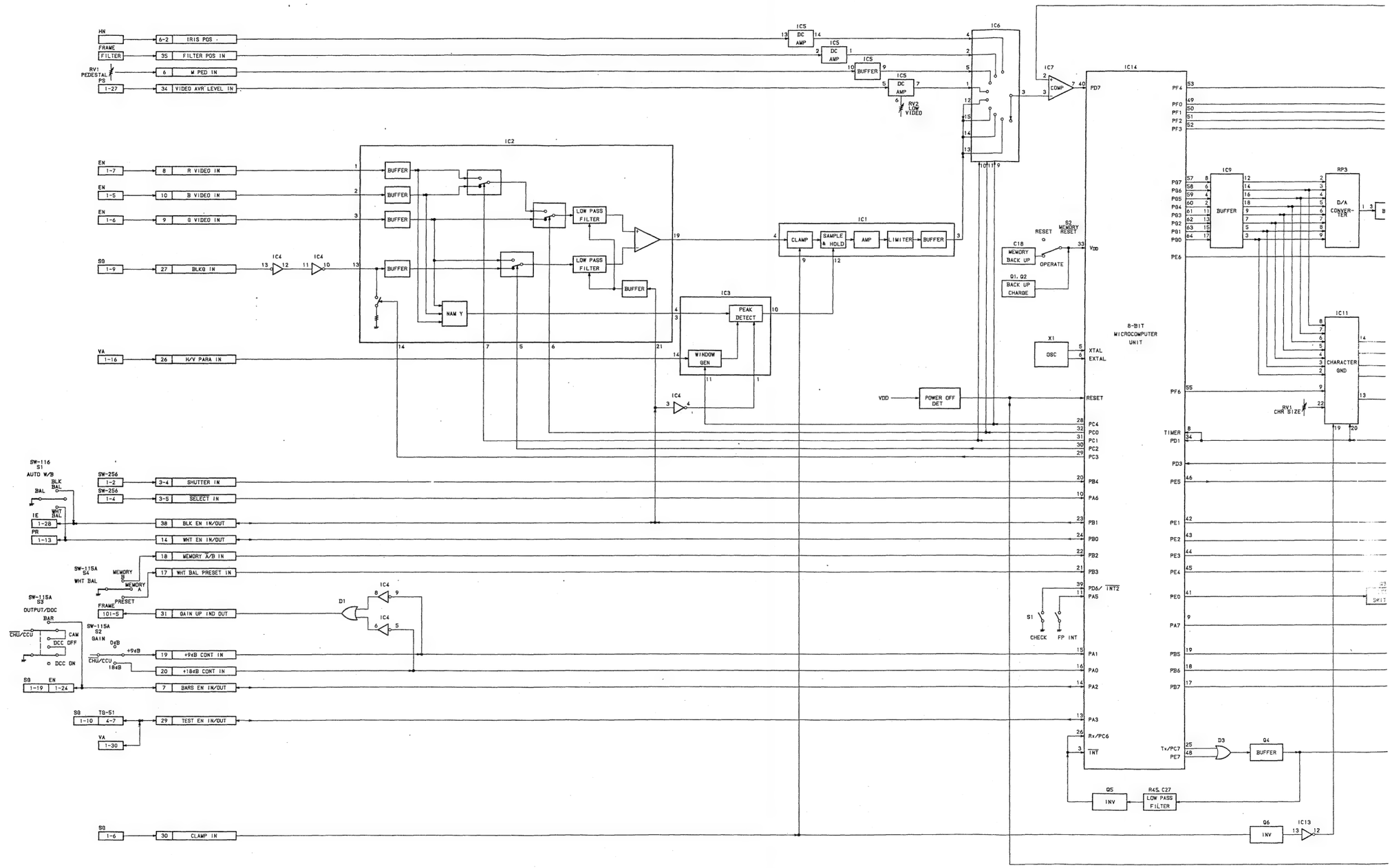
A-21 A-22

A B C D E F

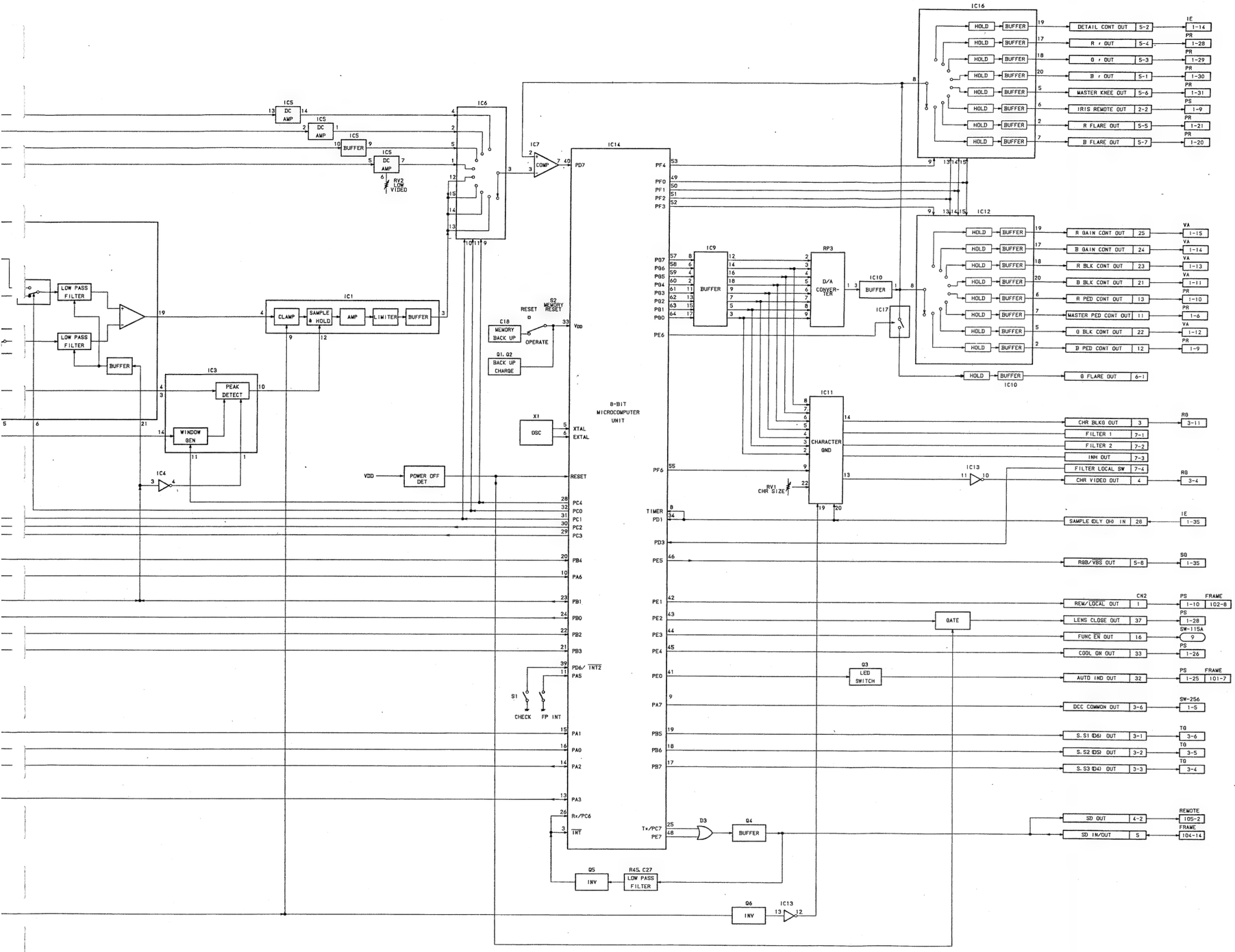
SG-143/143AP BLOCK



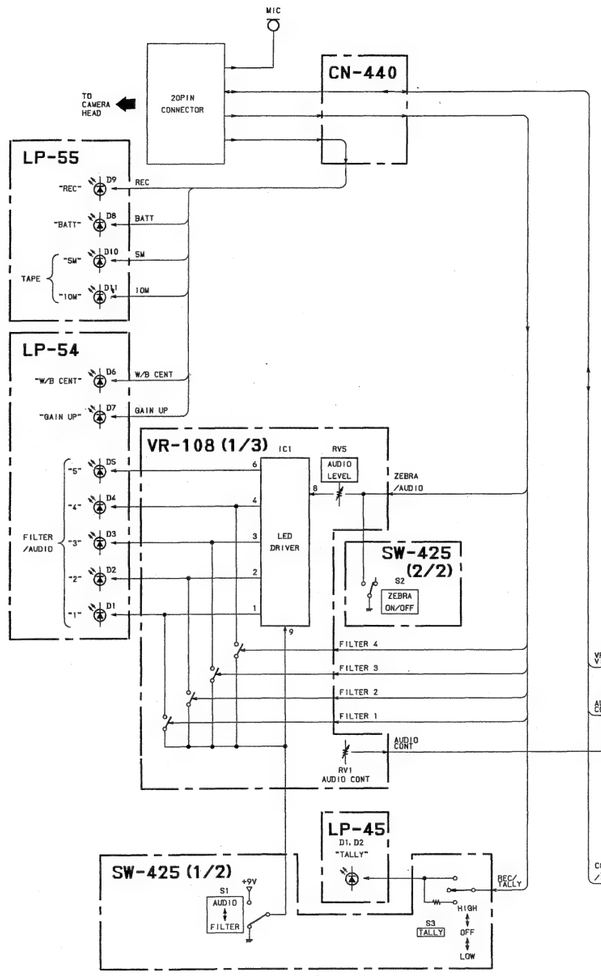
AT-58 BOARD

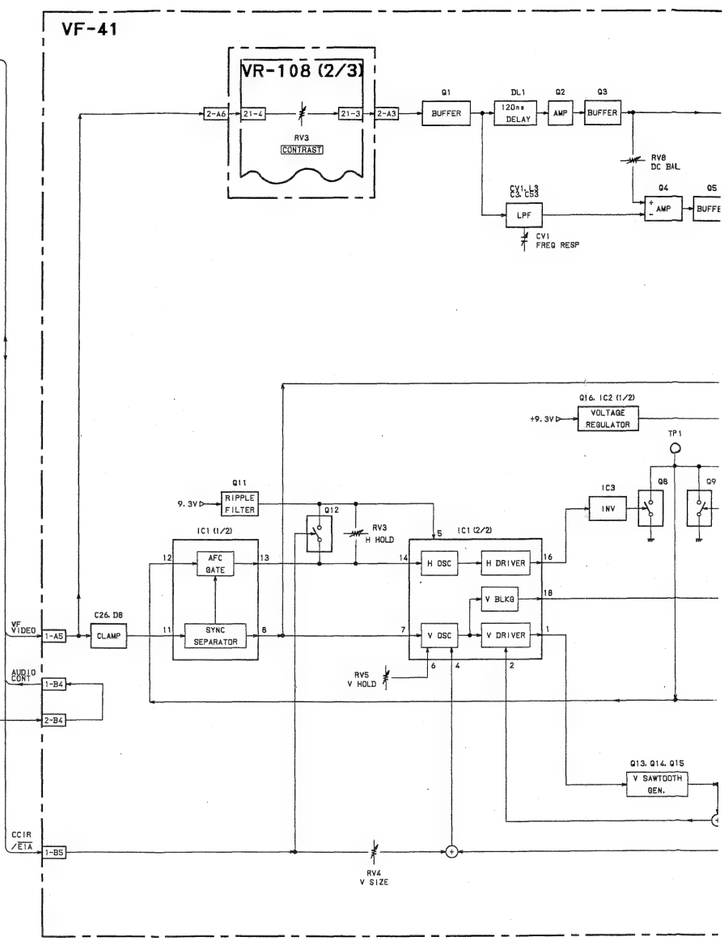

HN
FRAME FILTER
RV1 PEDESTAL
PS 1-27
6-2 IRIS POS
35 FILTER POS IN
6 W PED IN
34 VIDEO AVR LEVEL IN
EN 1-7
EN 1-5
EN 1-6
8 R VIDEO IN
10 B VIDEO IN
9 G VIDEO IN
SG 1-9
27 BLKG IN
VA 1-16
26 H/V PARA IN
IC2
BUFFER
NAM Y
LOW PASS FILTER
IC1
CLAMP
SAMPLE & HOLD
AMP
LIMITER
IC3
PEAK DETECT
WINDOW GEN
IC5
DC AMP
BUFFER
RV2 LOW VIDEO
IC6
IC7
COMP
IC14
8-BIT MICROCOMPUTER UNIT
C18 MEMORY BACK UP
S2 MEMORY RESET
RESET
OPERATE
Q1, Q2 BACK UP CHARGE
VDD
X1
OSC
XTAL
EXTAL
POWER OFF DET
RESET
PC4
PC0
PC1
PC2
PC3
PB4
PA6
PB1
PB0
PB2
PB3
PD6/ INT2
PA5
PA7
PA1
PA0
PA2
PA3
Rx/PC6
INT
Tx/PC7
PE7
D3
Q4
BUFFER
Q5
INV
R45, C27 LOW PASS FILTER
Q6
INV
IC13
S1 CHECK FP INT
IC9
BUFFER
RP3
D/A CONVERTER
IC11
CHARACTER GND
RV1 CHR SIZE
TIMER
PD1
PD3
PE5
PE1
PE2
PE3
PE4
PE0
PF4
PF0
PF1
PF2
PF3
PB7
PB6
PB5
PB4
PB3
PB2
PB1
PB0
PE6
PF6
SW-116 S1 AUTO W/B
BLK BAL
BAL
WHT BAL
1E 1-28
PR 1-13
SW-256 1-2
SW-256 1-4
3-4 SHUTTER IN
3-5 SELECT IN
38 BLK EN IN/OUT
14 WHT EN IN/OUT
18 MEMORY A/B IN
17 WHT BAL PRESET IN
SW-115A S4 WHT BAL
MEMORY B
MEMORY A
PRESET
SW-115A S3 OUTPUT/DOC
BAR
CAM
DCC OFF
DCC ON
SW-115A S2 GAIN
0dB
+9dB
+18dB
FRAME 101-5
31 GAIN UP IND OUT
19 +9dB CONT IN
20 +18dB CONT IN
SG 1-19
EN 1-24
7 BARS EN IN/OUT
SG 1-10
TG-51 4-7
29 TEST EN IN/OUT
VA 1-30
SG 1-6
30 CLAMP IN
D1
IC4

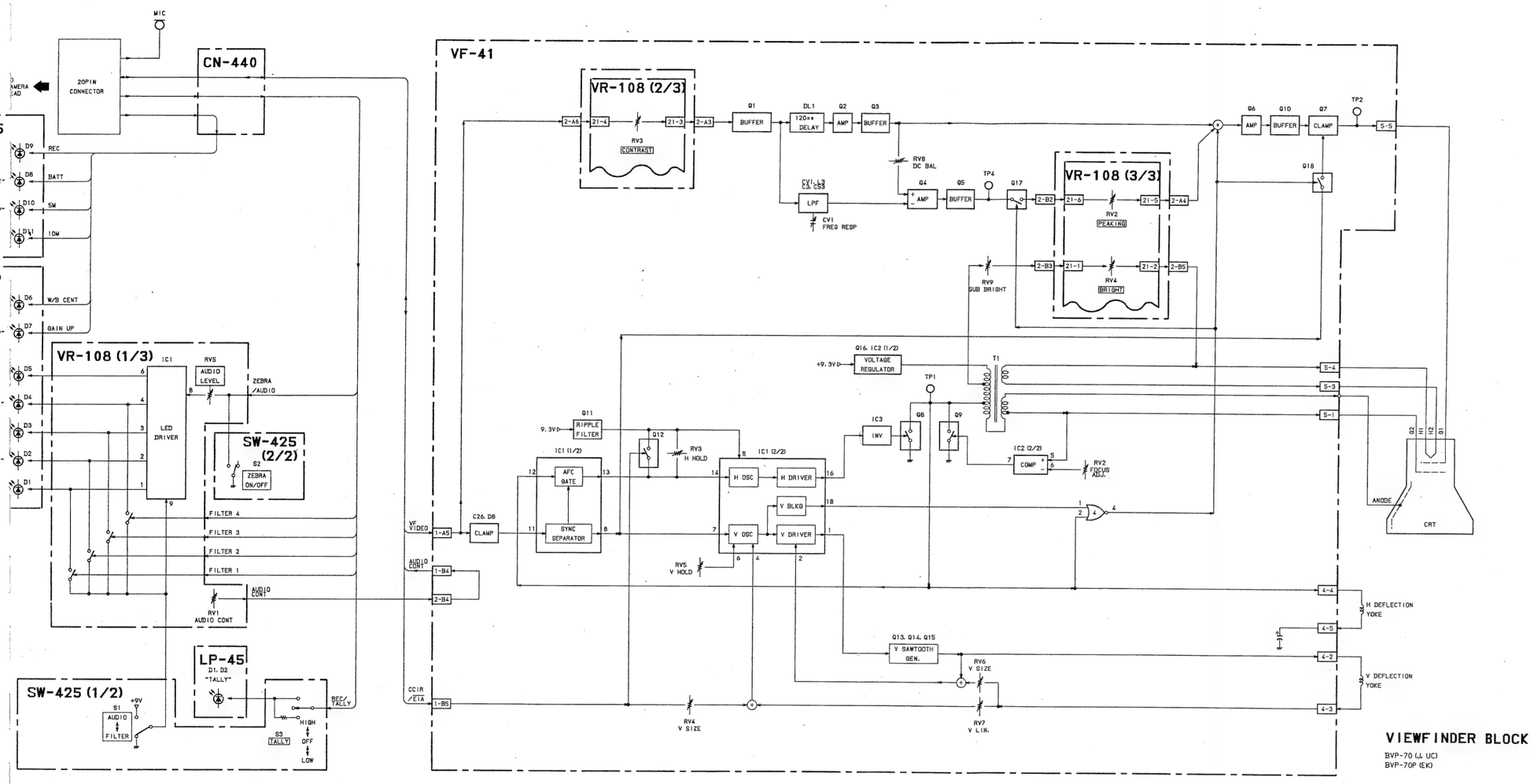
AT-58 BLOCK


IC5 DC AMP
IC5 DC AMP
IC5 BUFFER
IC5 DC AMP
RV2 LOW VIDEO
IC6
IC7 COMP
IC14
PD7
PF4
PF0
PF1
PF2
PF3
IC16
HOLD
BUFFER
DETAIL CONT OUT 5-2
R r OUT 5-4
G r OUT 5-3
B r OUT 5-1
MASTER KNEE OUT 5-6
IRIS REMOTE OUT 2-2
R FLARE OUT 5-5
B FLARE OUT 5-7
IC12
R GAIN CONT OUT 25
B GAIN CONT OUT 24
R BLK CONT OUT 23
B BLK CONT OUT 21
R PED CONT OUT 13
MASTER PED CONT OUT 11
G BLK CONT OUT 22
B PED CONT OUT 12
G FLARE OUT 6-1
IC10
LOW PASS FILTER
LOW PASS FILTER
BUFFER
IC1
CLAMP
SAMPLE & HOLD
AMP
LIMITER
BUFFER
IC3
PEAK DETECT
WINDOW GEN
IC4
C18 MEMORY BACK UP
S2 MEMORY RESET
RESET
OPERATE
Q1, Q2 BACK UP CHARGE
VDD
PD97
PD96
PD95
PD94
PD93
PD92
PD91
PD90
PE6
IC9 BUFFER
RP3 D/A CONVERTER
IC10 BUFFER
IC17
8-BIT MICROCOMPUTER UNIT
X1 OSC
XTAL
EXTAL
POWER OFF DET
RESET
IC11 CHARACTER GND
CHR BLKG OUT 3
FILTER 1 7-1
FILTER 2 7-2
INH OUT 7-3
FILTER LOCAL SW 7-4
CHR VIDEO OUT 4
IC13
RV1 CHR SIZE
PF6
TIMER
PD1
PD3
SAMPLE DLY CH0 IN 28
PE5
RGB/VBS OUT 5-8
PC4
PC0
PC1
PC2
PC3
PB4
PA6
PB1
PB0
PB2
PB3
PD6/ INT2
PA5
S1
CHECK
FP INT
PE1
PE2
PE3
PE4
PE0
GATE
REM/LOCAL OUT 1
LENS CLOSE OUT 37
FUNC EN OUT 16
COOL ON OUT 33
Q3 LED SWITCH
AUTO IND OUT 32
PA7
PB5
PB6
PB7
DCC COMMON OUT 3-6
S.S1 (D4) OUT 3-1
S.S2 (D5) OUT 3-2
S.S3 (D4) OUT 3-3
PA1
PA0
PA2
PA3
R×/PC6
INT
T×/PC7
PE7
D3
Q4 BUFFER
SD OUT 4-2
SD IN/OUT 5
Q5 INV
R45, C27 LOW PASS FILTER
Q6 INV
IC13

VIEWFINDER BLOCK







VIEWFINDER BLOCK

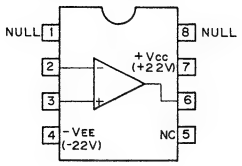
BVP-70 (J, UC)
BVP-70P (EK)

SECTION B
SEMICONDUCTOR

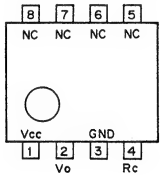
The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

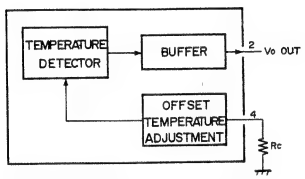
-15

AD707JR (ANALOG DEVICES) FLAT PACKAGE
OPERATIONAL AMPLIFIER
– TOP VIEW –



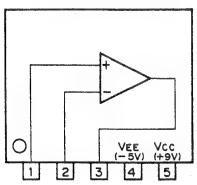
AN6701S (MATSUSHITA) FLAT PACKAGE
TEMPERATURE SENSING
– TOP VIEW –



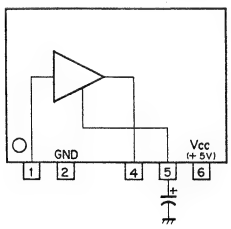


Rc : RESISTOR FOR CALIBRATION

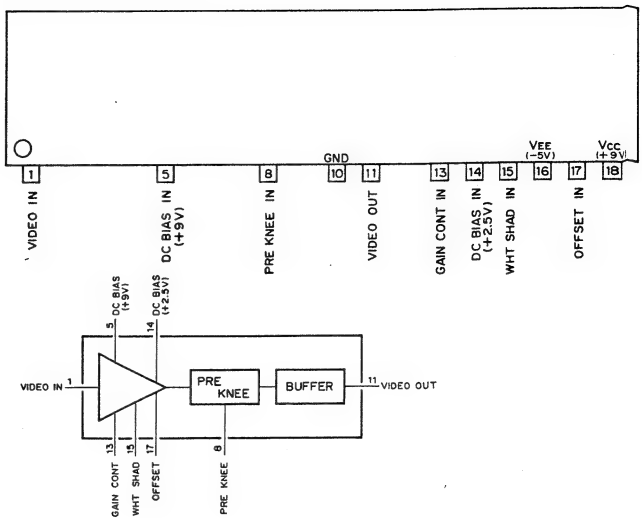
BH1210 (SONY)
VIDEO AMPLIFIER
– PRINTED SIDE VIEW –



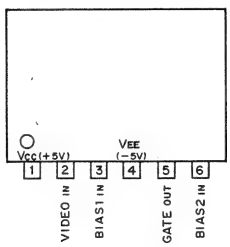
BH1211 (SONY)
VIDEO DRIVER
– PRINTED SIDE VIEW –

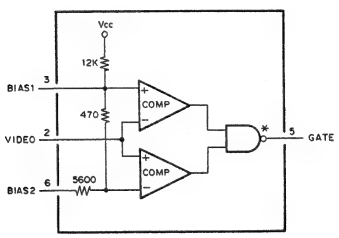


BH1212A (SONY)
GAIN CONT AMPLIFIER
– PRINTED SIDE VIEW –

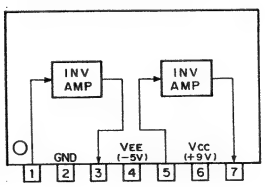


BH1213 (SONY)
VIDEO LEVEL DETECTOR
– PRINTED SIDE VIEW –



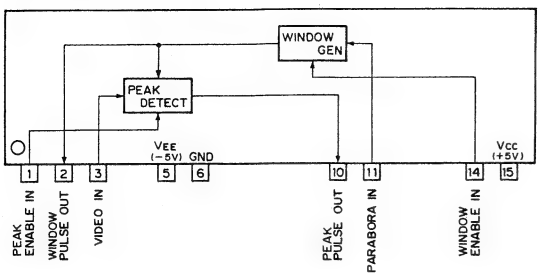


BH1214 (SONY)
DUAL VIDEO INV. AMPLIFIER
– PRINTED SIDE VIEW –



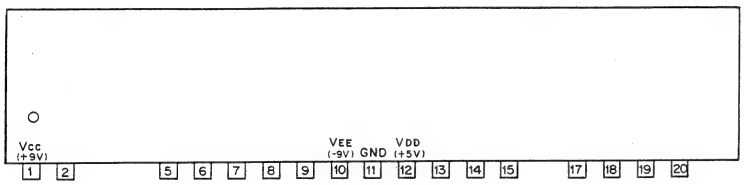
BH1221 (SONY)

SAMPLE PULSE GENERATOR
– PRINTED SIDE VIEW –



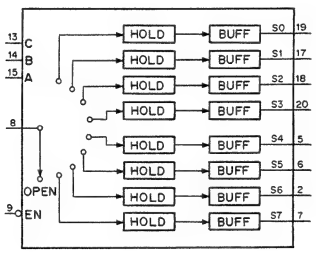
BX1179 (SONY)

8-CHANNEL SELECTABLE SAMPLING HOLDER
– PRINTED SIDE –



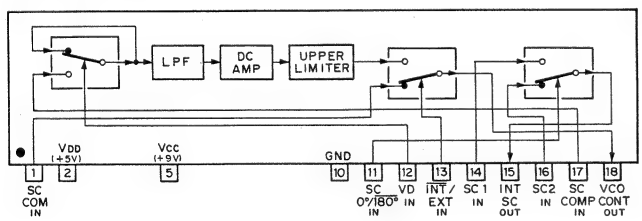
EN	C	B	A	"ON" CHANNEL
0	0	0	0	S0
0	0	0	1	S1
0	0	1	0	S2
0	0	1	1	S3
0	1	0	0	S4
0	1	0	1	S5
0	1	1	0	S6
0	1	1	1	S7
1	X	X	X	OPEN

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE



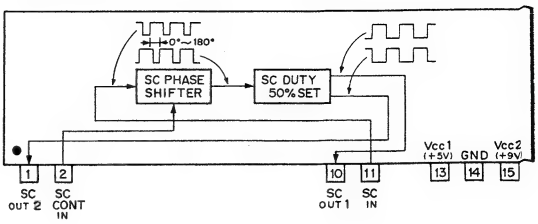
BX1338 (SONY)

APC AMPLIFIER AND SC 0° /180° SELECTOR
– REAR VIEW –



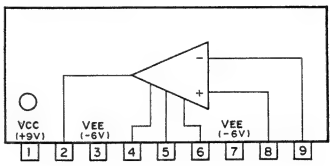
BX1339A (SONY)

SC PHASE SHIFTER
– REAR VIEW –



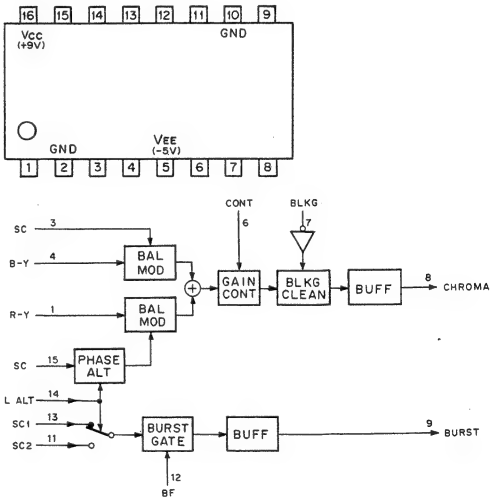
BX1356 (SONY)

VIDEO OUTPUT AMPLIFIER
– PRINTED SIDE –

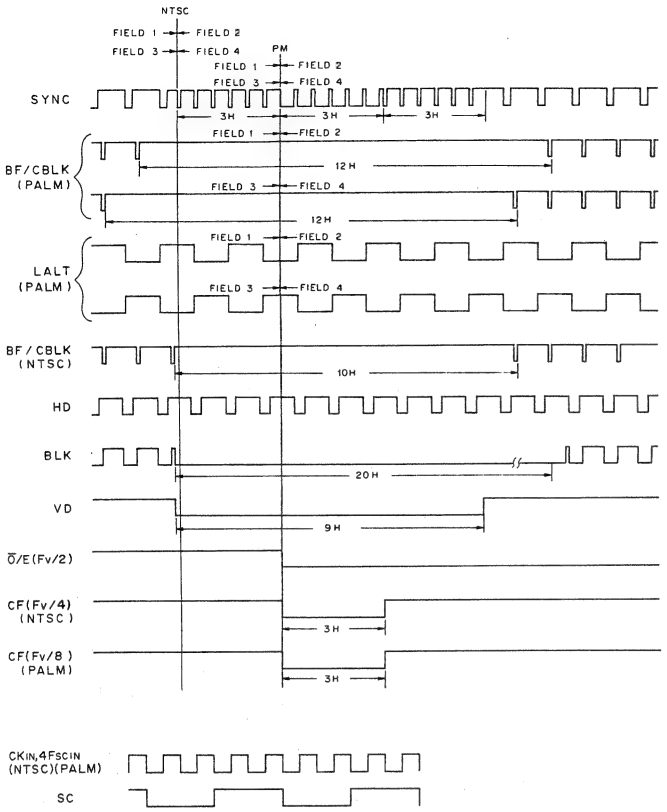


CX22017 (SONY)

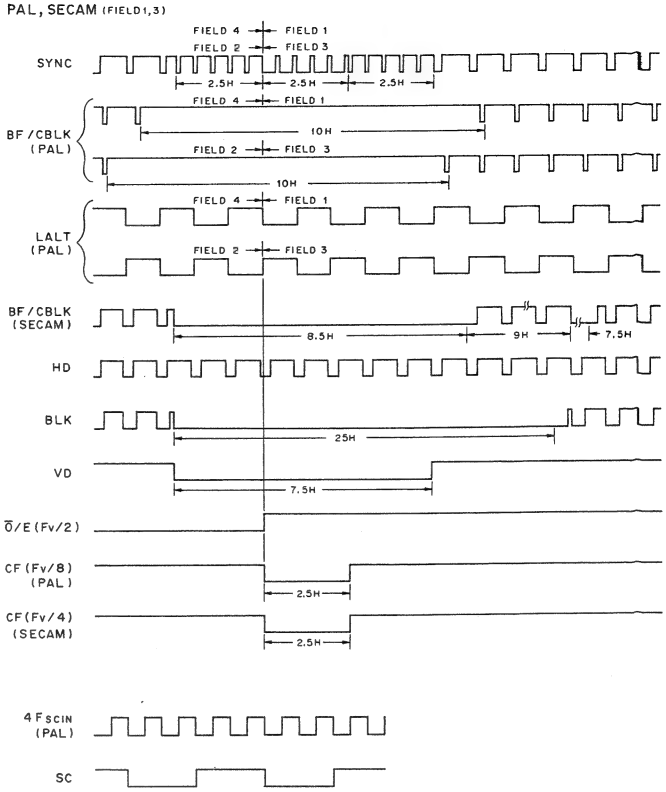
VIDEO SIGNAL PROCESSOR
– TOP VIEW –



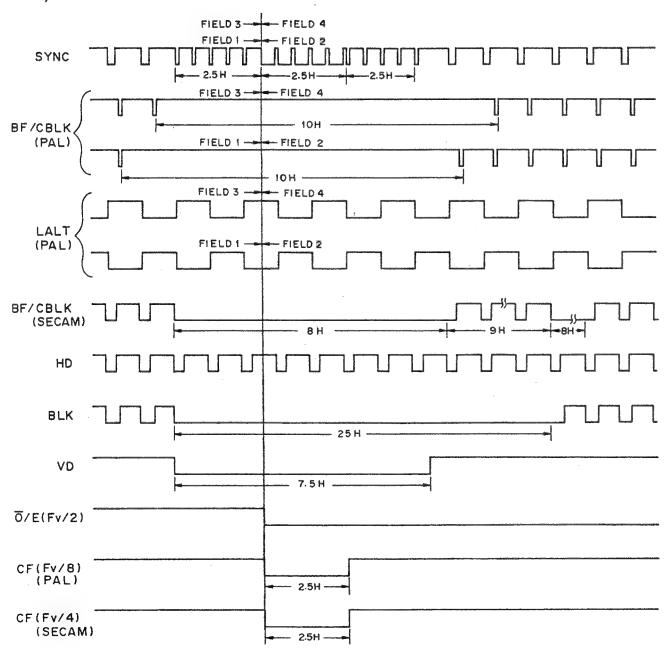
NTSC, PAL–M (FIELD 2, 4)



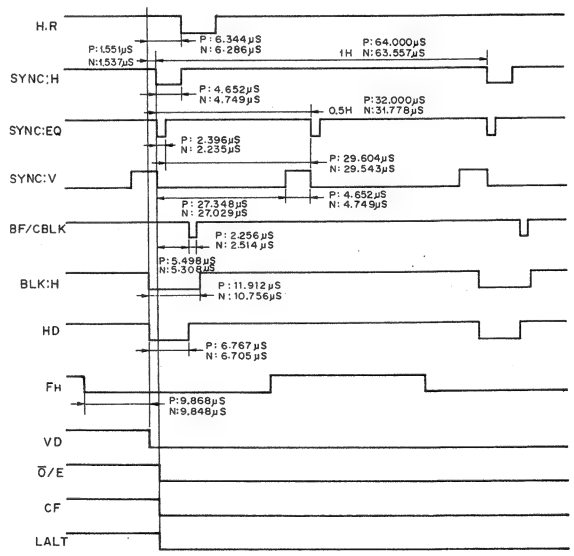
PAL, SECAM (FIELD 1, 3)



PAL, SECAM (FIELD 4, 2)



P: PAL, SECAM
N: NTSC, PALM



1. SYSTEM DESIGNATION

INPUT PAL/$\overline{\text{NTSC}}$ IN	SYSTEM
1	PAL, SECAM
0	NTSC, PALM

2. TYPE OF TUBE

INPUT MF/$\overline{\text{MM}}$ IN	FUNCTION
1	MAG-STA TUBE
0	MAG-MAG TUBE

3. V BLKG WIDTH (NTSC ONLY)

INPUT V BL 19	INPUT V BL 20	V BLKG WIDTH
1	X	19H
0	1	20H
0	0	21H

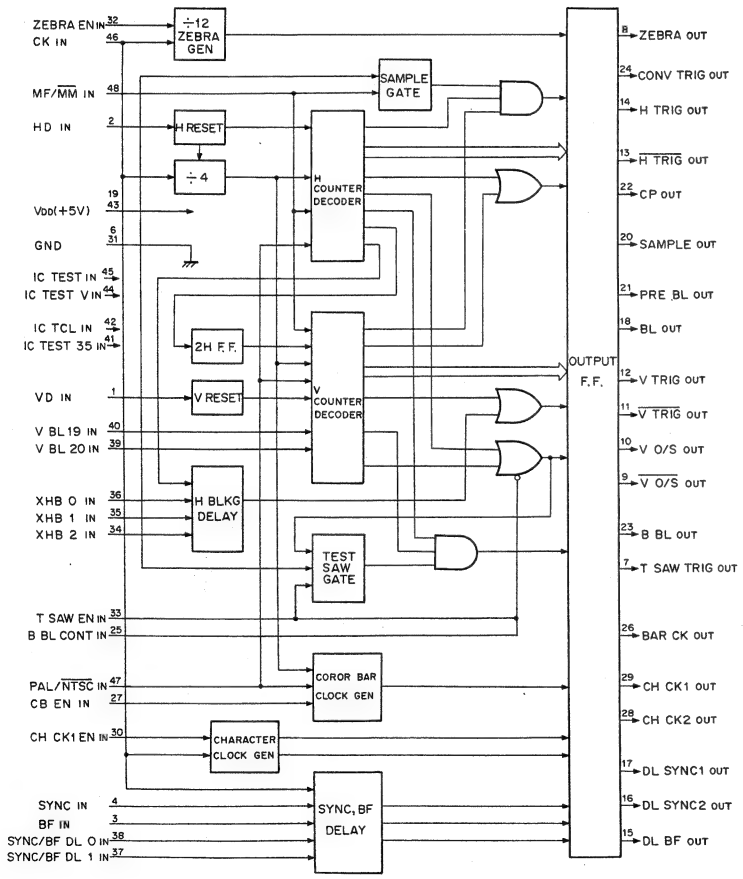
4. H BLKG WIDTH

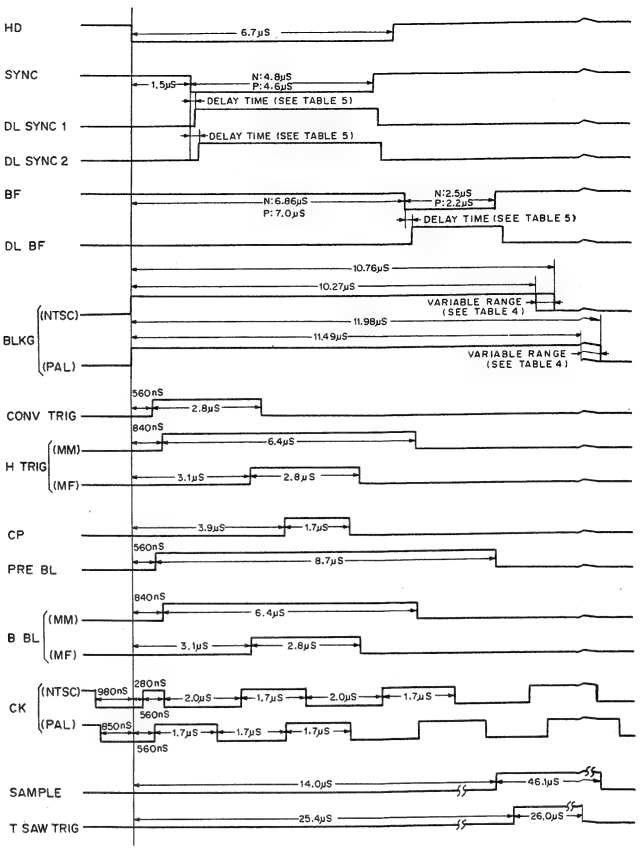
INPUT XHB2	INPUT XHB1	INPUT XHB0	BLKG WIDTH (μS) NTSC	PAL
1	1	1	10.27	11.49
1	1	0	10.34	11.56
1	0	1	10.41	11.63
1	0	0	10.48	11.70
0	1	1	10.55	11.77
0	1	0	10.62	11.84
0	0	1	10.69	11.91
0	0	0	10.76	11.98

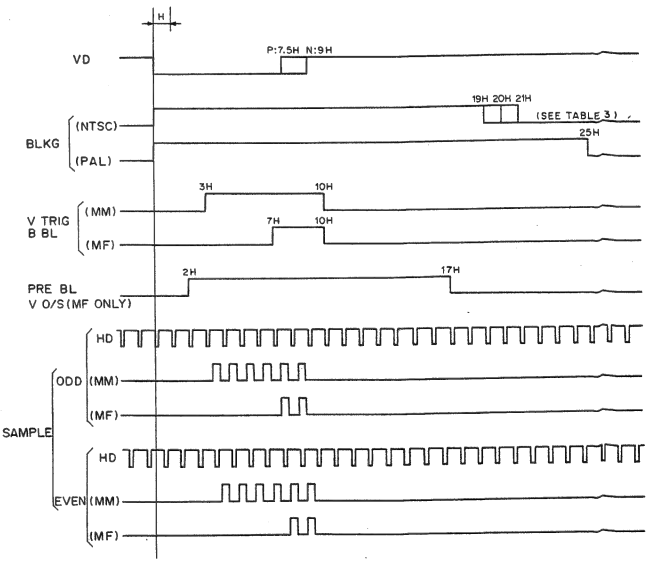
5. DELAY TIME

INPUT SYNC/BF DL1	INPUT SYNC/BF DL2	DELAY TIME (nS) DL SYNC 1	DL SYNC 2	DL BF
1	1	140	210	140
1	0	210	280	210
0	1	630	700	630
0	0	700	770	700

1; HIGH LEVEL
0; LOW LEVEL
X; DON'T CARE

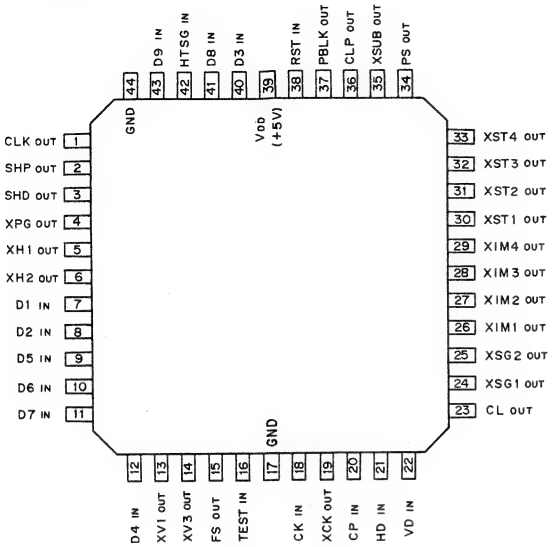






CXD8002 (SONY)

C-MOS TIMING PULSE GENERATOR FOR CCD
– TOP VIEW –



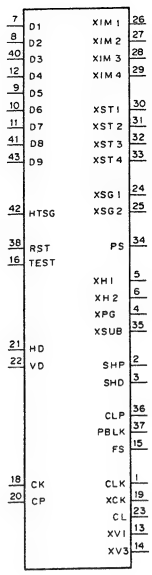
MODE SELECT

	LOW LEVEL	HIGH LEVEL
D1	CCIR	EIA
D2	FRAME	FIELD

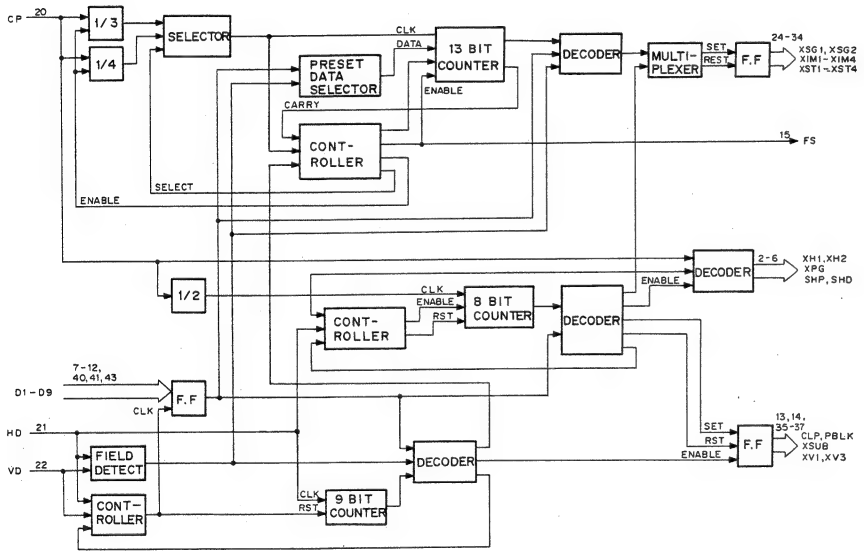
SHUTTER SPEED SELECT

D4	D5	D6	D7	SHUTTER SPEED (sec)
0	0	0	1	OFF
0	0	1	1	1/125
0	1	0	1	1/250
0	1	1	1	1/500
1	0	0	1	1/1000
1	0	1	1	1/2000
1	1	0	1	1/4000
1	1	1	1	1/10000
X	X	X	0	1/100 (EIA) 1/60 (CCIR)

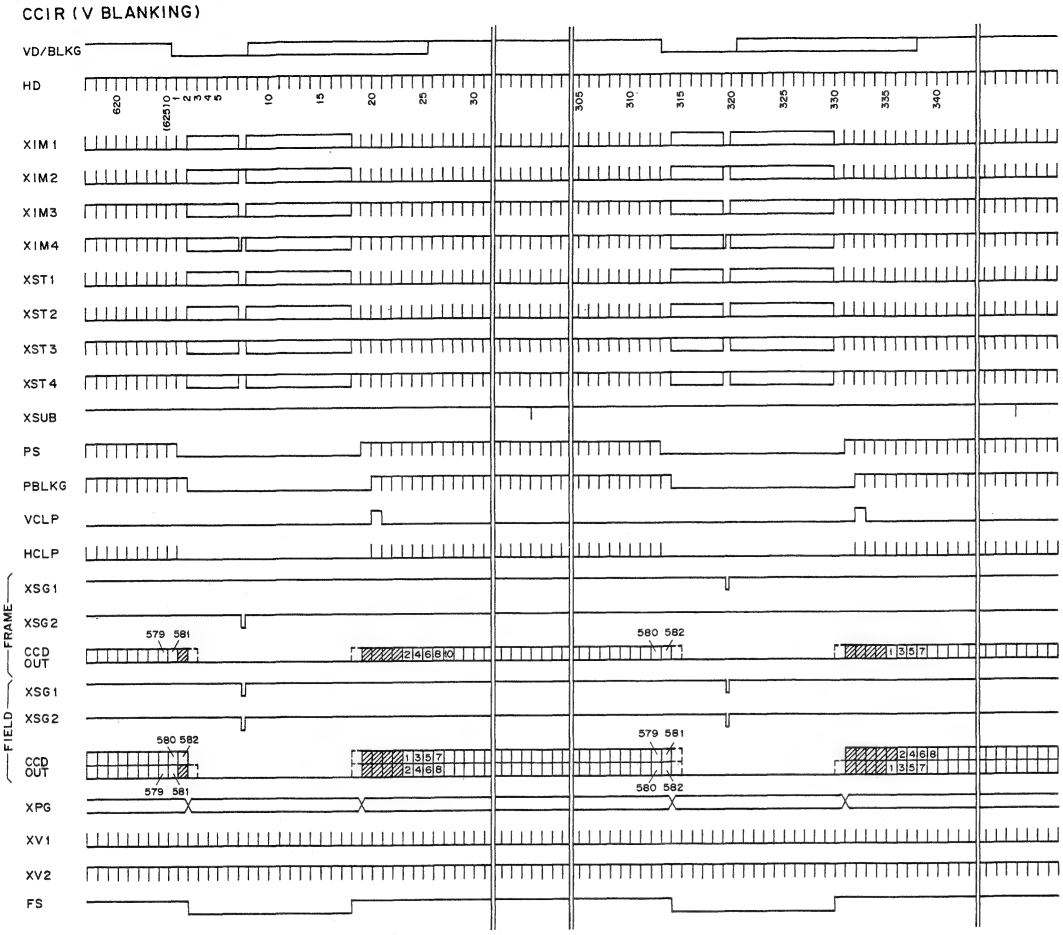
0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE



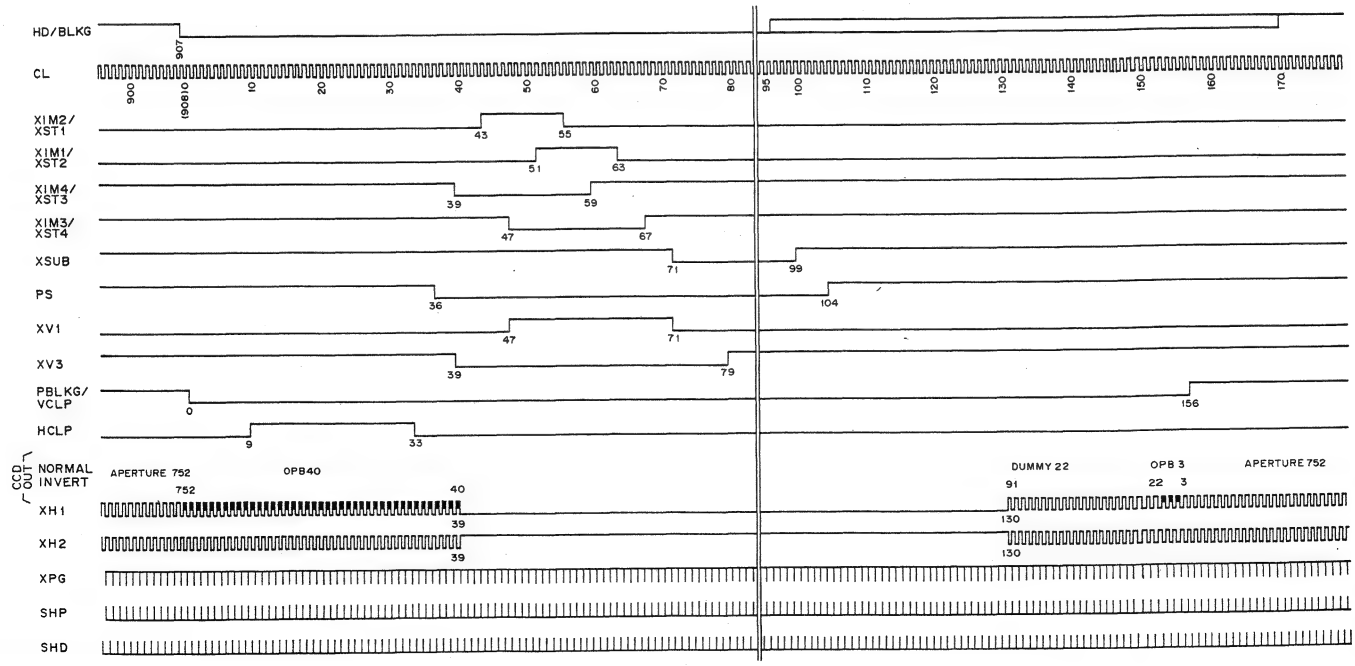
CK	: CLOCK INPUTS
XCK	: INVERTED CLOCK OUTPUT
CLK, CL	: CLOCK OUTPUTS
HD	: HORIZONTAL DRIVE INPUT
VD	: VERTICAL DRIVE INPUT
XSG1, XSG2	: CLOCK OUTPUTS FOR READ OUT FROM IMAGE SENSOR
XIM1 – XIM4	: CLOCK OUTPUTS FOR IMAGE REGISTOR DRIVE OF CCD
XST1 – XST4	: CLOCK OUTPUTS FOR STORAGE REGISTOR DRIVE OF CCD
PS	: VERTICAL DRIVER POWER SAVE PULSE OUTPUT
XH1, XH2	: HORIZONTAL REGISTOR TRANSMISSION CLOCK OUTPUTS
XPG	: PRE-CHARGE GATE PULSE OUTPUT
XSUB	: ELECTRIC CHARGE DISCHARGING PULSE OUTPUT
SHP	: PRE-CHARGE LEVEL SAMPLE & HOLD PULSE OUTPUT
SHD	: DATA LEVEL SAMPLE & HOLD PULSE OUTPUT
CLP	: CLAMP PULSE OUTPUT
PBLK	: PRE-BLANKING PULSE OUTPUT
FS	: FLAG
XV1, XV3	: CLOCK OUTPUTS FOR INTERFACE
HTSG	: READ OUT STOP SIGNAL INPUT
RST, TEST	: TEST MODE SIGNAL INPUTS
D1 – D3, D8, D9	: MODE SELECT SIGNAL INPUTS
D4 – D7	: SHUTTER SPEED MODE SIGNAL INPUTS



CCIR (V BLANKING)

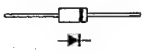


CCIR (H BLANKING)



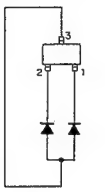
SECTION B
SEMICONDUCTOR

The circuit diagram of IC is obtained from the IC data book published by the manufacturer.



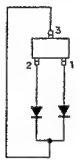
1S1555
1S1555S
1SS119

TOP VIEW (SCALE 4/1)



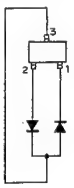
1S2835-T1

TOP VIEW (SCALE 4/1)

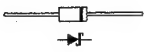


1S2837-T1

TOP VIEW (SCALE 4/1)

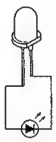


1SS123
HSM88AS

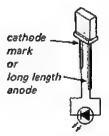


1SS97-1
ERA81-004
ERB81-004

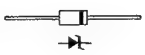
1SZ46A



GL-5LR40 ; RED



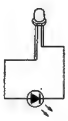
GL9NG2 ; YELLOWISH GREEN
GL9PR20 ; RED



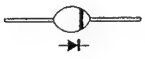
HZ ?A ?L
HZ ?ALL
HZ ?B ?L
HZ ?BLL
HZ ?C ?L
HZ ?CLL

TOP VIEW (SCALE 4/1)

RD ? ?M

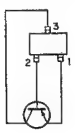


SEL2110R ; RED
TLG124A ; GREEN
TL0124 ; ORANGE



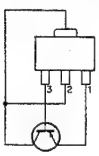
U05G
V09C
V11 ?

TOP VIEW (SCALE 4/1)



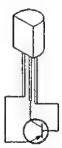
2SA1162G
2SA1226
2SA1462
2SA812
2SB624
2SB815

TOP VIEW (SCALE 4/1)



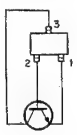
2SA1463

2SB733

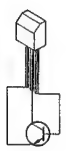


2SB739

TOP VIEW (SCALE 4/1)

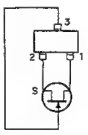


2SC1009A
2SC1623
2SC2712
2SC2757
2SC3360
2SD1048
NTM2369

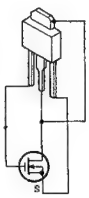


2SD773

TOP VIEW (SCALE 4/1)

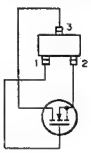


2SK300
2SK508
2SK94

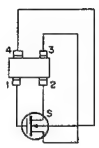


2SK612

TOP VIEW (SCALE 2/1)

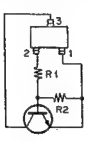


2SK620

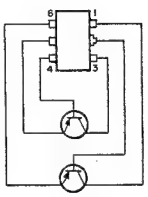


3SK163

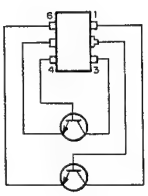
TOP VIEW (SCALE 4/1)



DTC144WK (R1 = 47K, R2 = 22K)

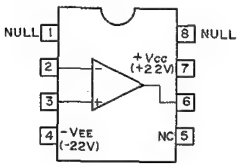


XN6435

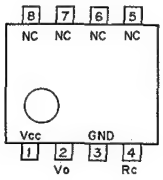


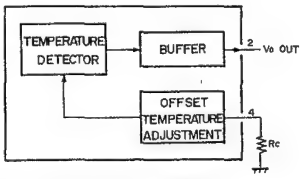
XN6501
XN6534

AD707JR (ANALOG DEVICES) FLAT PACKAGE
OPERATIONAL AMPLIFIER
– TOP VIEW –



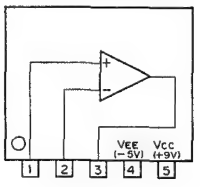
AN6701S (MATSUSHITA) FLAT PACKAGE
TEMPERATURE SENSING
– TOP VIEW –



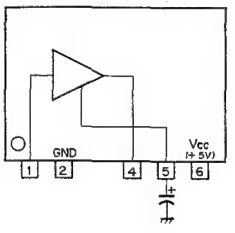


Rc : RESISTOR FOR CALIBRATION

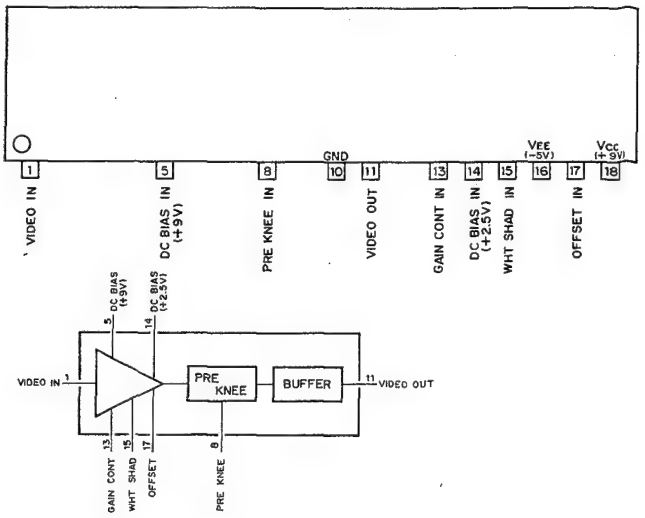
BH1210 (SONY)
VIDEO AMPLIFIER
– PRINTED SIDE VIEW –



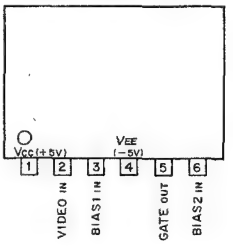
BH1211 (SONY)
VIDEO DRIVER
– PRINTED SIDE VIEW –

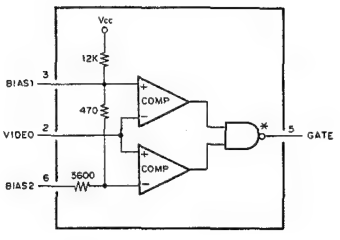


BH1212A (SONY)
GAIN CONT AMPLIFIER
– PRINTED SIDE VIEW –

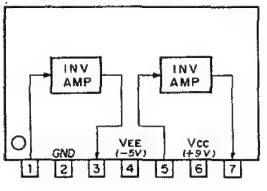


BH1213 (SONY)
VIDEO LEVEL DETECTOR
– PRINTED SIDE VIEW –



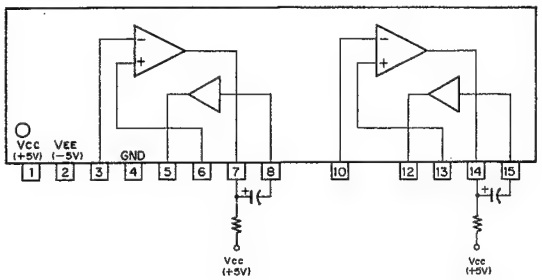


BH1214 (SONY)
DUAL VIDEO INV. AMPLIFIER
– PRINTED SIDE VIEW –



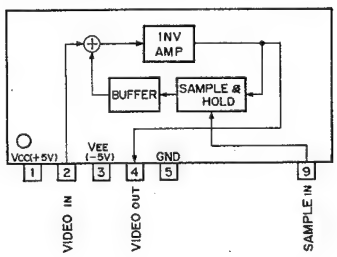
BH1215A (SONY)

VIDEO AMPLIFIER AND DRIVER
– PRINTED SIDE VIEW –



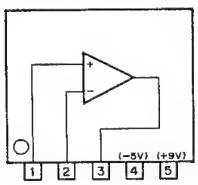
BH1216 (SONY)

VIDEO AMPLIFIER WITH CLAMP
– PRINTED SIDE VIEW –



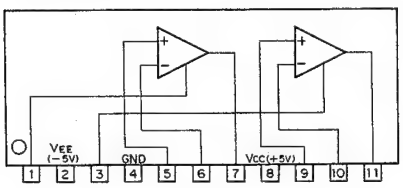
BH1217 (SONY)

VIDEO AMPLIFIER
– PRINTED SIDE VIEW –



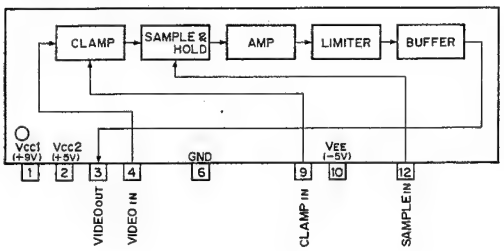
BH1218 (SONY)

VIDEO AMPLIFIER
– PRINTED SIDE VIEW –



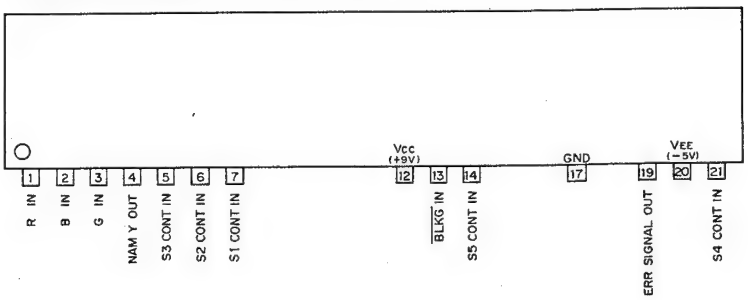
BH1219A (SONY)

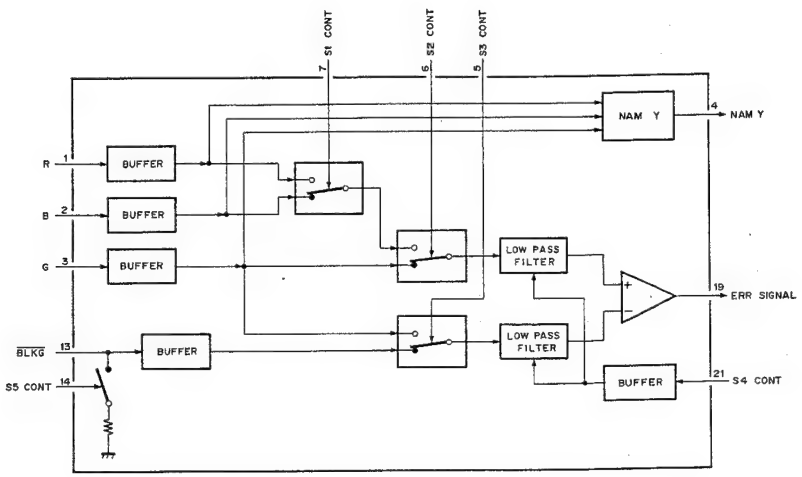
VIDEO DC CONVERTER
– PRINTED SIDE VIEW –



BH1220 (SONY)

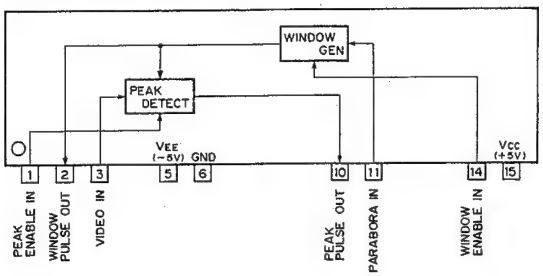
VIDEO SWITCHER AND ERROR SIGNAL GENERATER
– PRINTED SIDE VIEW –





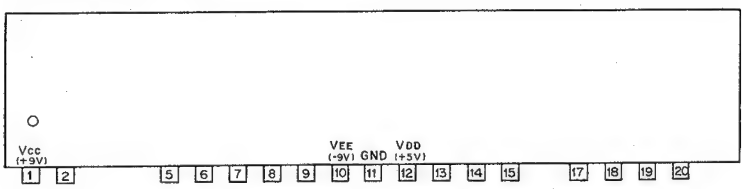
BH1221 (SONY)

SAMPLE PULSE GENERATOR
– PRINTED SIDE VIEW –



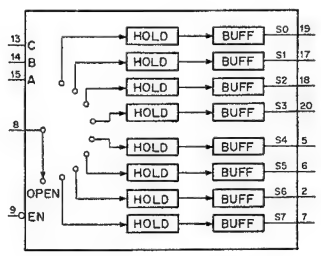
BX1179 (SONY)

8-CHANNEL SELECTABLE SAMPLING HOLDER
– PRINTED SIDE –



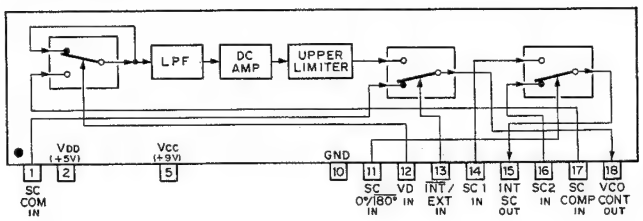
EN	C	B	A	"ON" CHANNEL
0	0	0	0	S0
0	0	0	1	S1
0	0	1	0	S2
0	0	1	1	S3
0	1	0	0	S4
0	1	0	1	S5
0	1	1	0	S6
0	1	1	1	S7
1	X	X	X	OPEN

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE



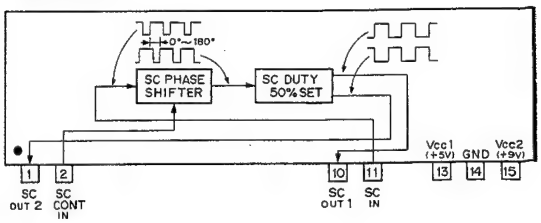
BX1338 (SONY)

APC AMPLIFIER AND SC 0° /180° SELECTOR
– REAR VIEW –



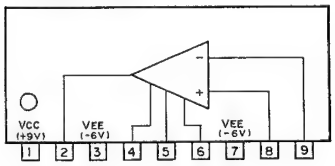
BX1339A (SONY)

SC PHASE SHIFTER
– REAR VIEW –



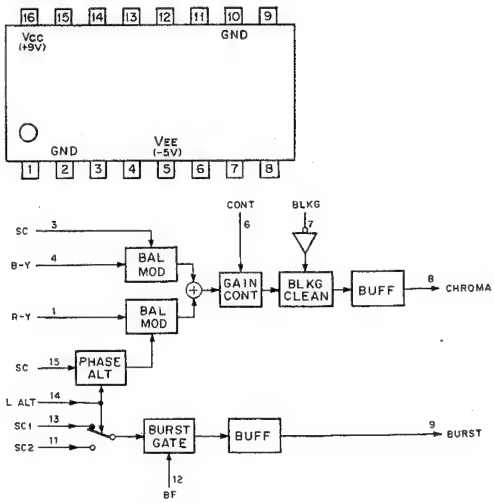
BX1356 (SONY)

VIDEO OUTPUT AMPLIFIER
– PRINTED SIDE –



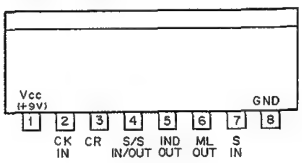
CX22017 (SONY)

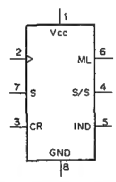
VIDEO SIGNAL PROCESSOR
– TOP VIEW –

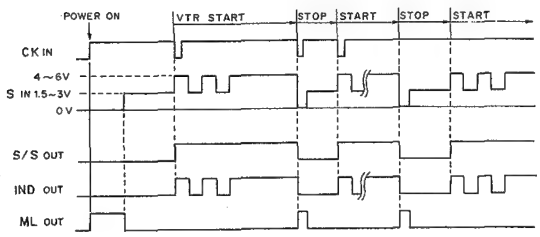


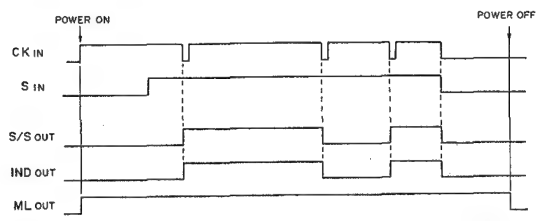
CX518 (SONY)

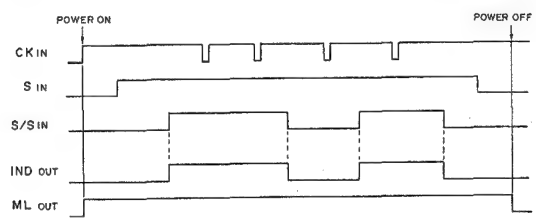
INTERFACE CIRCUIT BETWEEN VTR AND CAMERA
– SIDE VIEW –





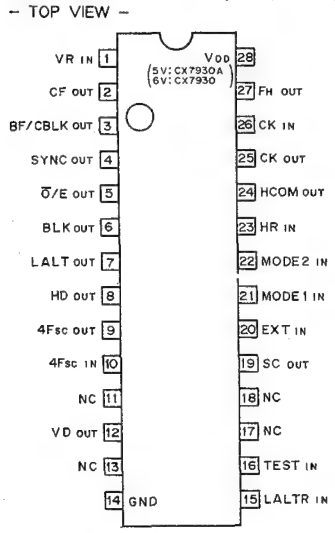


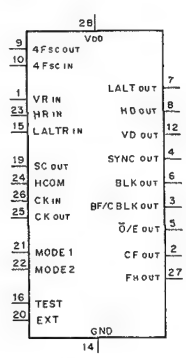




CX7930A (SONY) FLAT PACKAGE

C-MOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)
– TOP VIEW –





O/E : ODD/EVEN FIELD
CF : COLOR FRAME PULSE
HCOM : H COMPARATOR

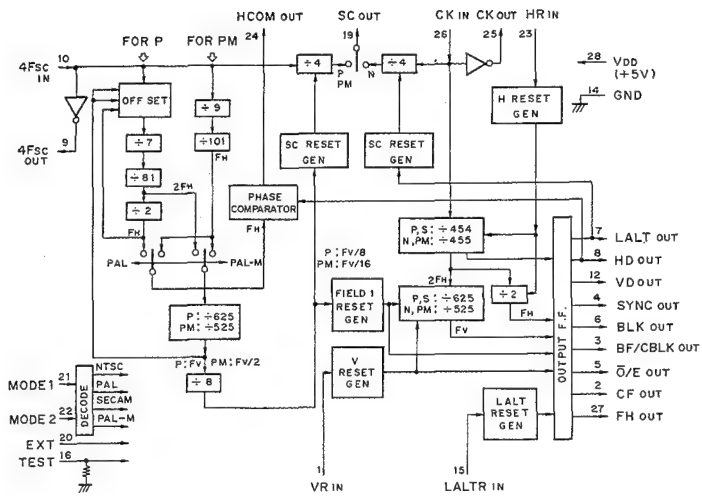
SYSTEM	4Fsc	CLOCK
NTSC	910 FH	910FH
PAL	1135 FH+2Fv	908FH
PALM	909FH	910FH
SECAM	———	908FH

INPUTS		SYSTEM
MODE 1	MODE 2	
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

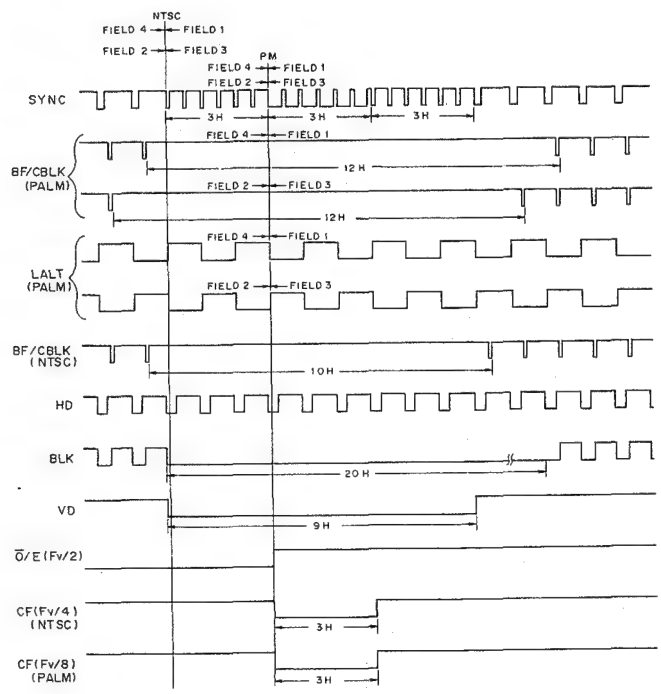
0 ; LOW LEVEL (GND)
1 ; HIGH LEVEL (VDD)

INPUTS		FUNCTION
EXT	TEST	
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

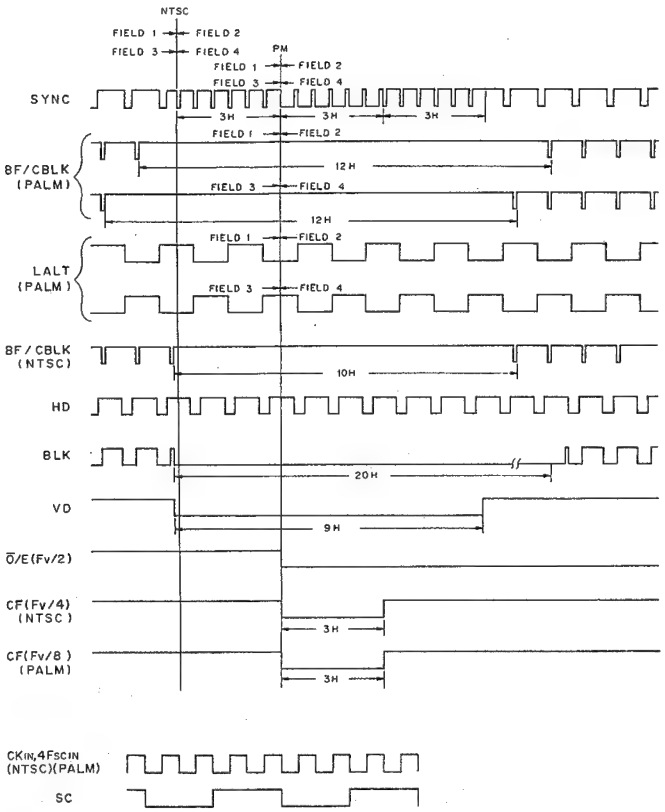
TEST "0": OPEN
(INTERNALLY PULLED DOWN)



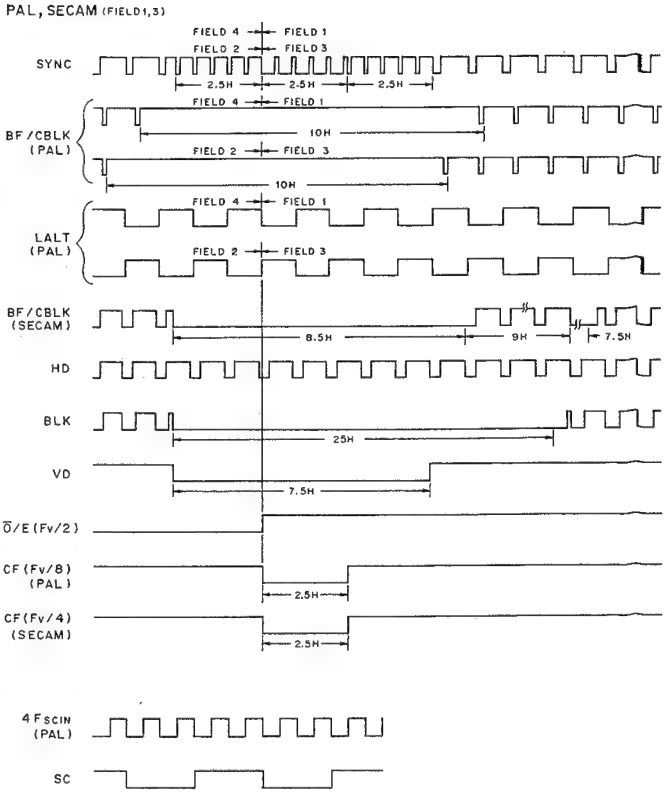
NTSC, PAL-M (FIELD 1,3)



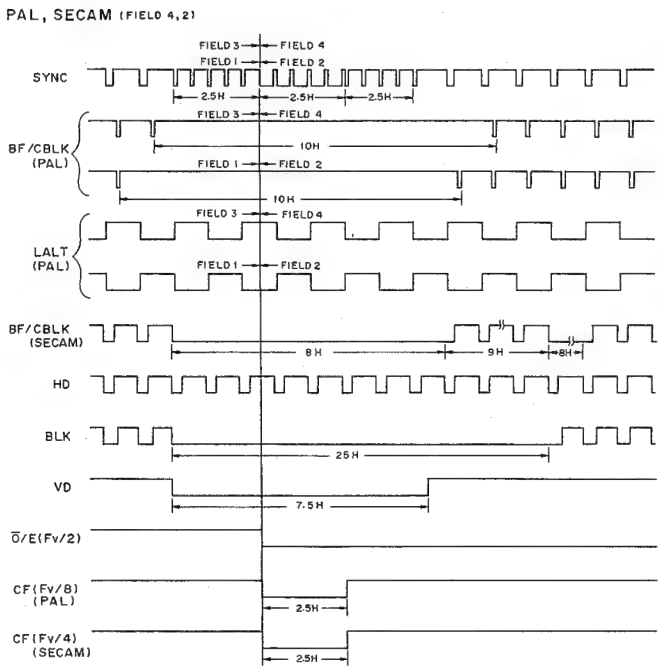
NTSC, PAL–M (FIELD 2, 4)



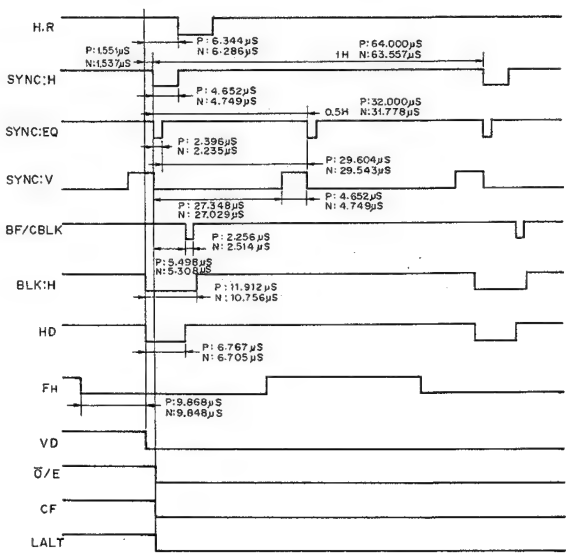
PAL, SECAM (FIELD 1, 3)



PAL, SECAM (FIELD 4, 2)

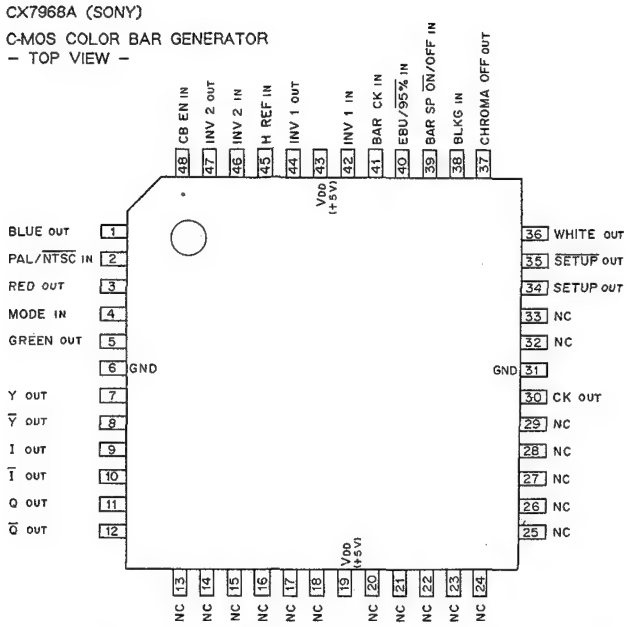


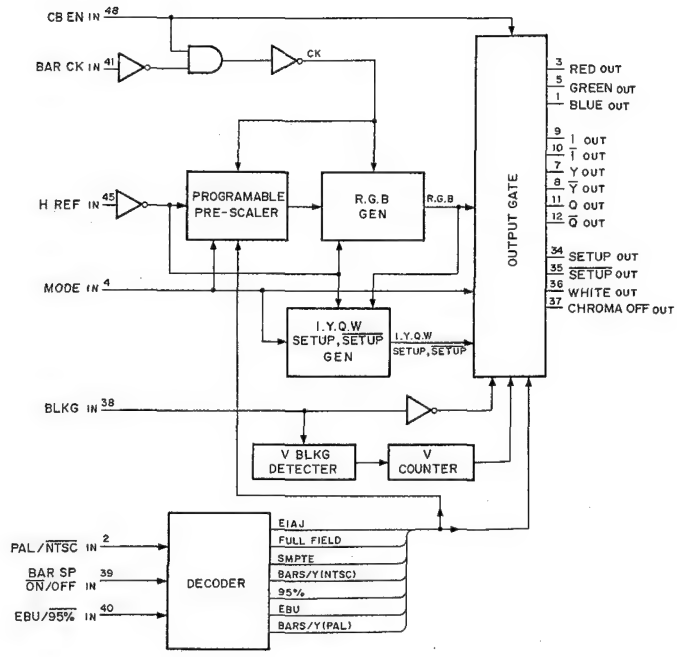
P: PAL, SECAM
N: NTSC, PALM



CX7968A (SONY)

C-MOS COLOR BAR GENERATOR
– TOP VIEW –



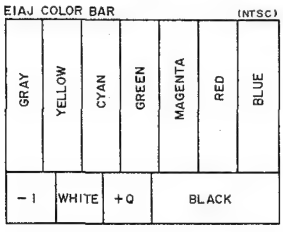


INPUT				FUNCTION
PAL/NTSC	MODE	EBU/95%	BAR SP	
0	0	0	0	EIAJ COLOR BAR
0	0	0	1	FULL FIELD COLOR BAR
0	0	1	0	INHIBIT
0	0	1	1	INHIBIT
0	1	0	0	EIAJ COLOR BAR
0	1	0	1	FULL FIELD COLOR BAR
0	1	1	0	SMPTE COLOR BAR
0	1	1	1	COLOR BAR + Y BAR
1	0	0	0	95% COLOR BAR
1	0	0	1	INHIBIT
1	0	1	0	EBU COLOR BAR
1	0	1	1	INHIBIT
1	1	0	0	95% COLOR BAR
1	1	0	1	COLOR BAR+Y BAR
1	1	1	0	EBU COLOR BAR
1	1	1	1	INHIBIT

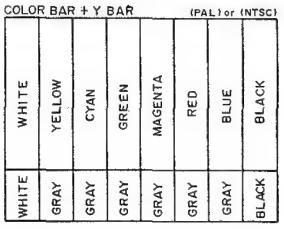
0 ; LOW LEVEL
1 ; HIGH LEVEL

O COLOR BAR PATTERN

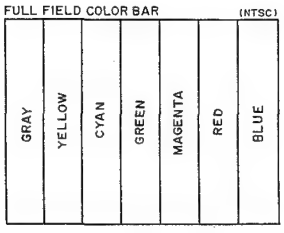
EIAJ COLOR BAR (NTSC)



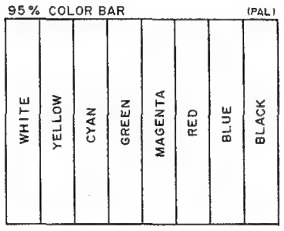
COLOR BAR + Y BAR (PAL) or (NTSC)



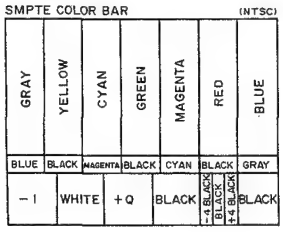
FULL FIELD COLOR BAR (NTSC)



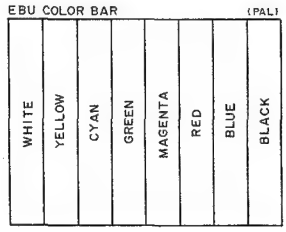
95% COLOR BAR (PAL)



SMPTE COLOR BAR (NTSC)

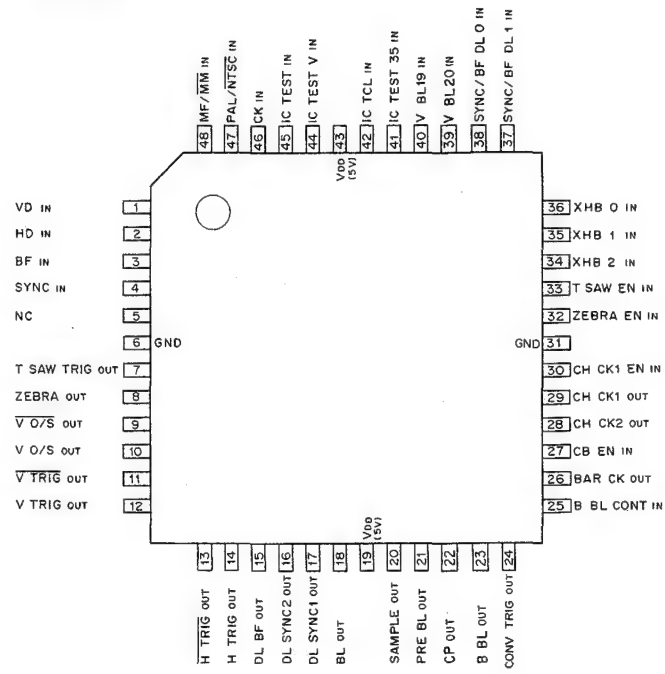


EBU COLOR BAR (PAL)



CX7969 (SONY)

C-MOS PULSE GENERATOR
– TOP VIEW –



1. SYSTEM DESIGNATION

INPUT	SYSTEM
PAL/$\overline{\text{NTSC}}$ IN	
1	PAL, SECAM
0	NTSC, PALM

2. TYPE OF TUBE

INPUT	FUNCTION
MF/$\overline{\text{MM}}$ IN	
1	MAG-STA TUBE
0	MAG-MAG TUBE

3. V BLKG WIDTH (NTSC ONLY)

INPUT		V BLKG WIDTH
V BL 19	V BL 20	
1	X	19H
0	1	20H
0	0	21H

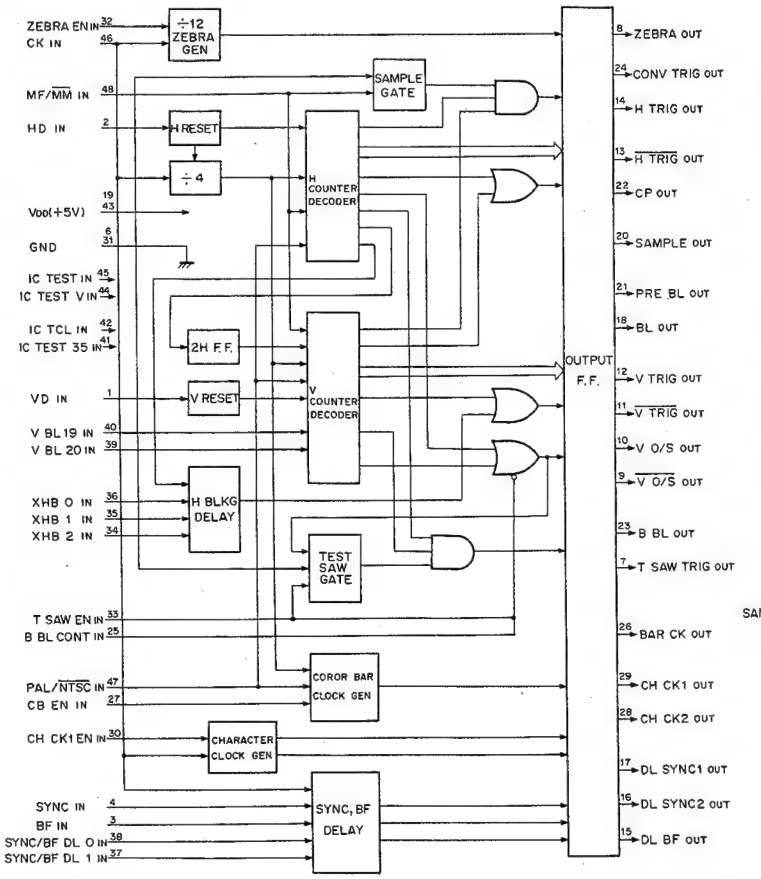
4. H BLKG WIDTH

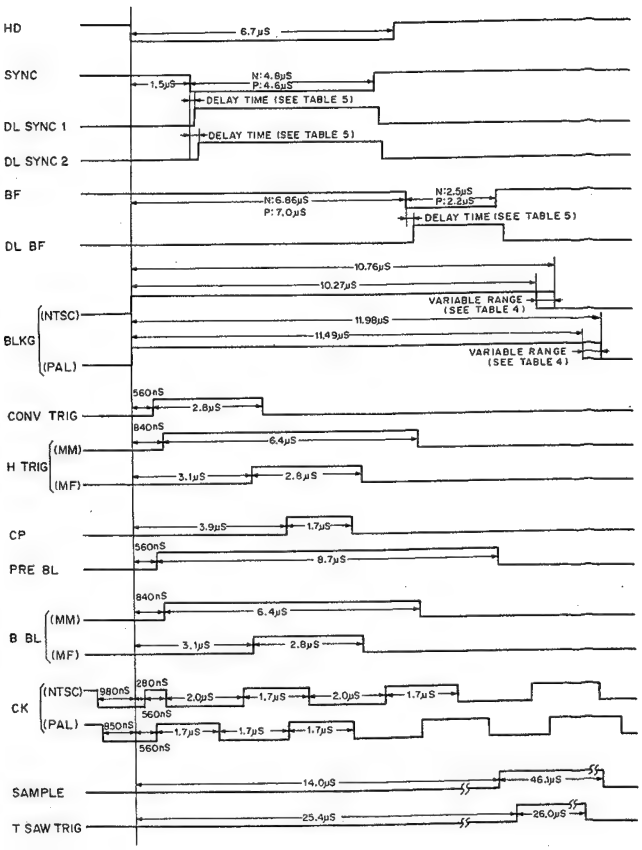
INPUT			BLKG WIDTH (μS)	
XHB2	XHB1	XHB0	NTSC	PAL
1	1	1	10.27	11.49
1	1	0	10.34	11.56
1	0	1	10.41	11.63
1	0	0	10.48	11.70
0	1	1	10.55	11.77
0	1	0	10.62	11.84
0	0	1	10.69	11.91
0	0	0	10.76	11.98

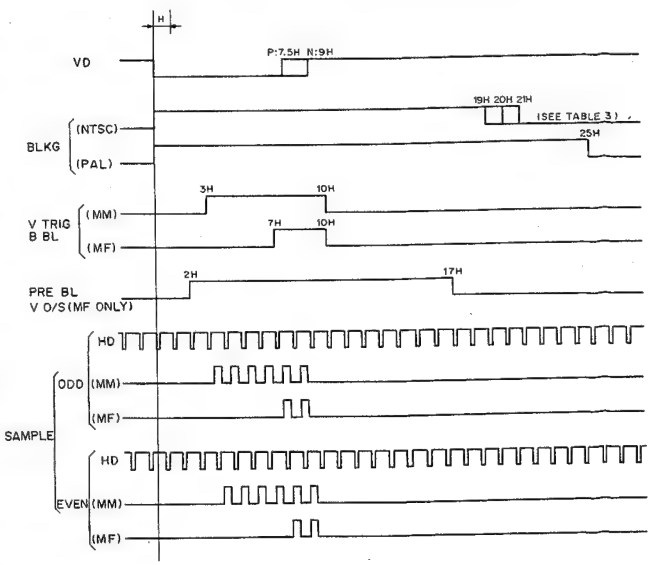
5. DELAY TIME

INPUT		DELAY TIME (nS)		
SYNC/BF DL1	SYNC/BF DL2	DL SYNC 1	DL SYNC 2	DL BF
1	1	140	210	140
1	0	210	280	210
0	1	630	700	630
0	0	700	770	700

1; HIGH LEVEL
0; LOW LEVEL
X; DON'T CARE

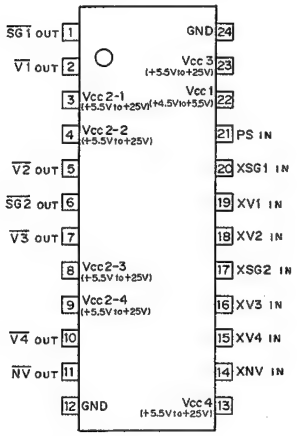




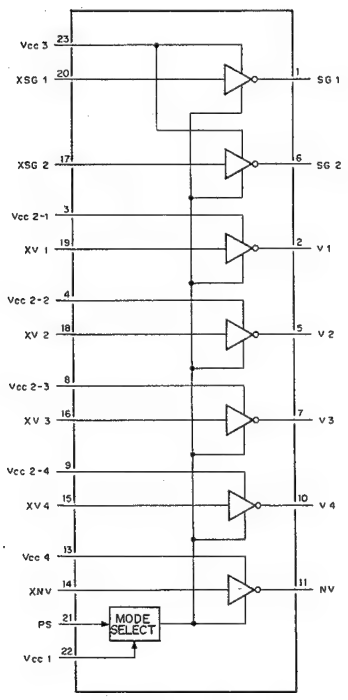


CXA1065M (SONY) FLAT PACKAGE

INVERTING DRIVER FOR CCD CLOCK WITH POWER SAVE
– TOP VIEW –

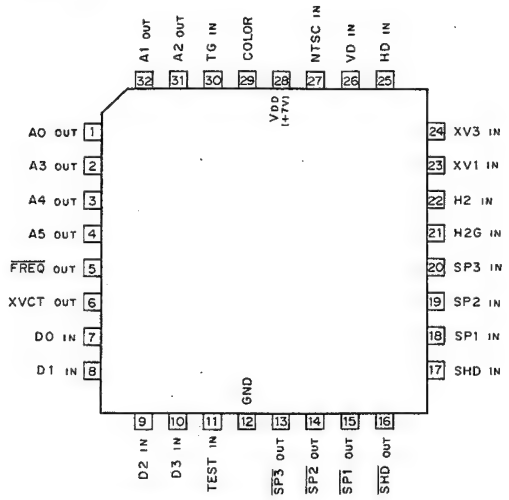


XV1–XV4 ; VERTICAL REGISTER TRANSMISSION CLOCK INPUT
$\overline{V1}$ – $\overline{V4}$; VERTICAL REGISTER TRANSMISSION CLOCK OUTPUT
XSG1, XSG2 ; SENSER GATE PULSE INPUT
$\overline{SG1}$, $\overline{SG2}$; SENSER GATE PULSE OUTPUT
XNV ; DRIVER INPUT
$\overline{NV}$; DRIVER OUTPUT
PS ; POWER SAVE INPUT
Vcc 1 ; BIAS VOLTAGE
Vcc 2-1 ; $\overline{V1}$ OUTPUT PULSE VOLTAGE
Vcc 2-2 ; $\overline{V2}$ OUTPUT PULSE VOLTAGE
Vcc 2-3 ; $\overline{V3}$ OUTPUT PULSE VOLTAGE
Vcc 2-4 ; $\overline{V4}$ OUTPUT PULSE VOLTAGE
Vcc 3 ; $\overline{SG1}$, $\overline{SG2}$ OUTPUT PULSE VOLTAGE
Vcc 4 ; $\overline{NV}$ OUTPUT PULSE VOLTAGE



CXD1251Q (SONY)

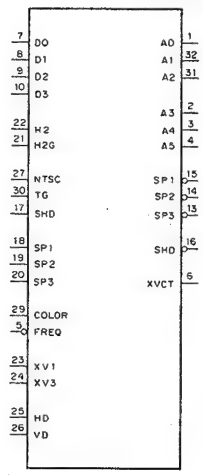
C-MOS TIMING CONTROLLER
– TOP VIEW –



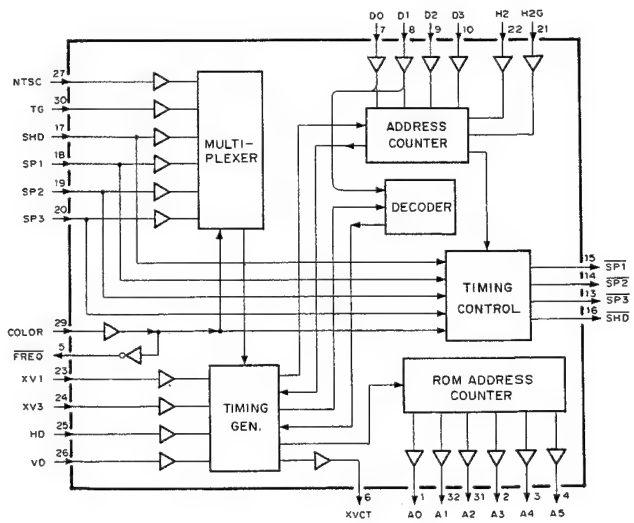
MODE SELECTION

	1	0
NTSC	CCIR MODE	NTSC MODE
COLOR	B/W MODE	COLOR MODE
TG	IC FOR TG: CXD1149 USE	IC FOR TG: CXD1155/1156 USE

1 ; HIGH LEVEL
0 ; LOW LEVEL

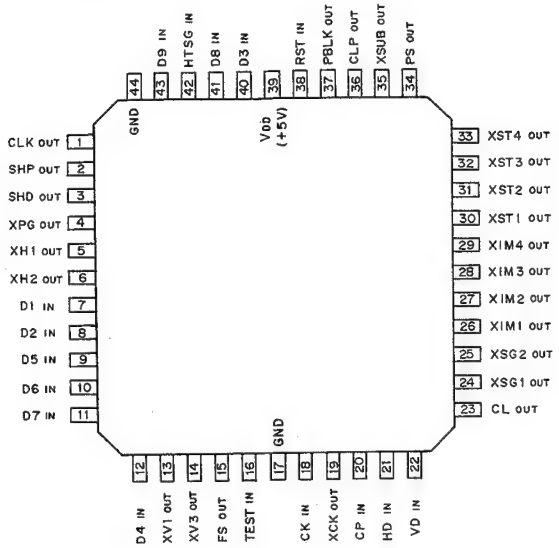


D1–D4 ; EXTERNAL ROM DATA INPUT
A0–A5 ; EXTERNAL ROM ADDRESS OUTPUT
$\overline{SP1}$–$\overline{SP3}$; SAMPLE HOLD PULSE
$\overline{SHD}$; DATA SAMPLE HOLD PULSE
H2, H2G ; CLOCK INPUT FOR HORIZONTAL REGISTER TRANSMISSION
XV1, XV3 ; CLOCK INPUT FOR VERTICAL REGISTER TRANSMISSION
XVCT ; POWER CONTROL OUTPUT FOR EXTERNAL ROM
HD ; HORIZONTAL DRIVE INPUT
VD ; VERTICAL DRIVE INPUT



CXD8002 (SONY)

C-MOS TIMING PULSE GENERATOR FOR CCD
– TOP VIEW –



MODE SELECT

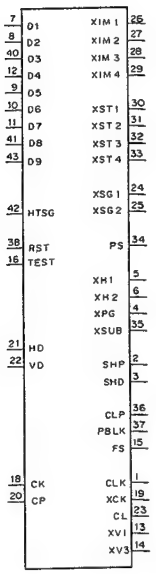
	LOW LEVEL	HIGH LEVEL
D1	CCIR	EIA
D2	FRAME	FIELD

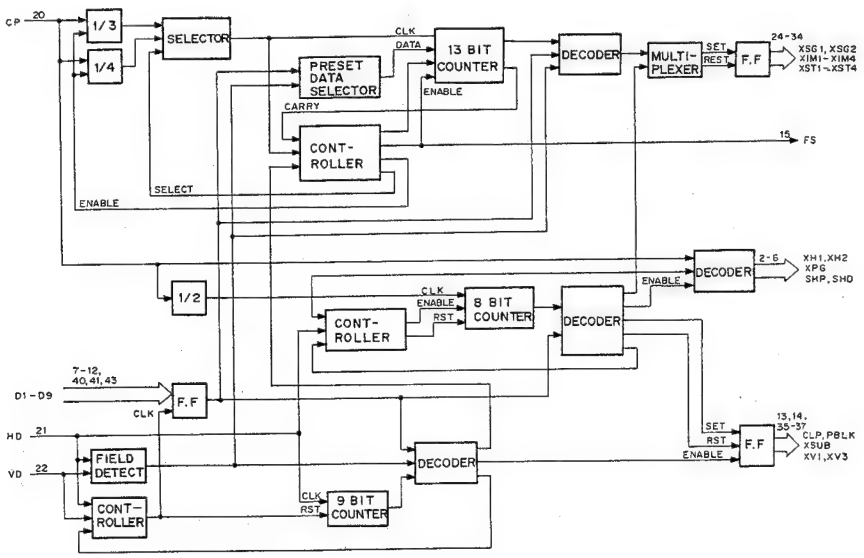
SHUTTER SPEED SELECT

D4	D5	D6	D7	SHUTTER SPEED (sec)
0	0	0	1	OFF
0	0	1	1	1/125
0	1	0	1	1/250
0	1	1	1	1/500
1	0	0	1	1/1000
1	0	1	1	1/2000
1	1	0	1	1/4000
1	1	1	1	1/10000
X	X	X	0	1/100 (EIA) 1/60 (CCIR)

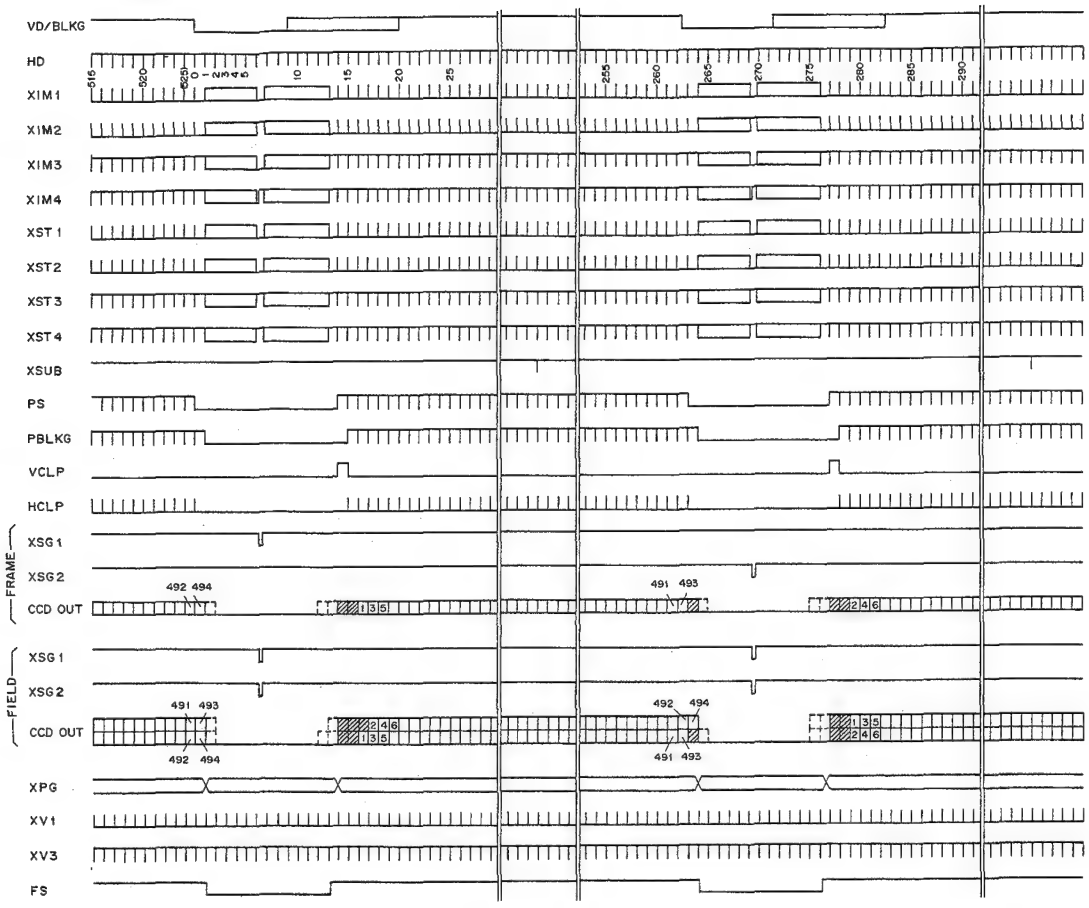
0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE

CK	; CLOCK INPUTS
XCK	; INVERTED CLOCK OUTPUT
CLK, CL	; CLOCK OUTPUTS
HD	; HORIZONTAL DRIVE INPUT
VD	; VERTICAL DRIVE INPUT
XSG1,XSG2	; CLOCK OUTPUTS FOR READ OUT FROM IMAGE SENSOR
XIM1 – XIM4	; CLOCK OUTPUTS FOR IMAGE REGISTOR DRIVE OF CCD
XST1 – XST4	; CLOCK OUTPUTS FOR STORAGE REGISTOR DRIVE OF CCD
PS	; VERTICAL DRIVER POWER SAVE PULSE OUTPUT
XH1, XH2	; HORIZONTAL REGISTOR TRANSMISSION CLOCK OUTPUTS
XPG	; PRE-CHARGE GATE PULSE OUTPUT
XSUB	; ELECTRIC CHARGE DISCHARGING PULSE OUTPUT
SHP	; PRE-CHARGE LEVEL SAMPLE & HOLD PULSE OUTPUT
SHD	; DATA LEVEL SAMPLE & HOLD PULSE OUTPUT
CLP	; CLAMP PULSE OUTPUT
PBLK	; PRE-BLANKING PULSE OUTPUT
FS	; FLAG
XV1, XV3	; CLOCK OUTPUTS FOR INTERFACE
HTSG	; READ OUT STOP SIGNAL INPUT
RST, TEST	; TEST MODE SIGNAL INPUTS
D1 – D3, D8, D9	; MODE SELECT SIGNAL INPUTS
D4 – D7	; SHUTTER SPEED MODE SIGNAL INPUTS

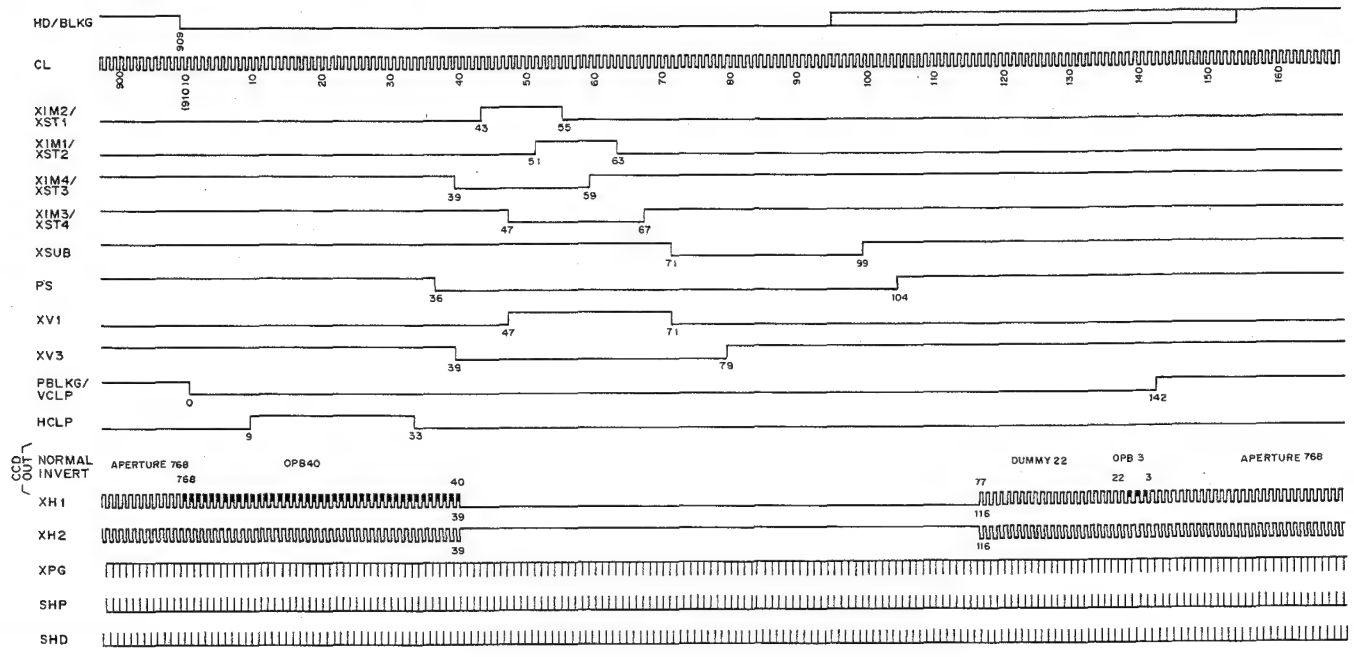




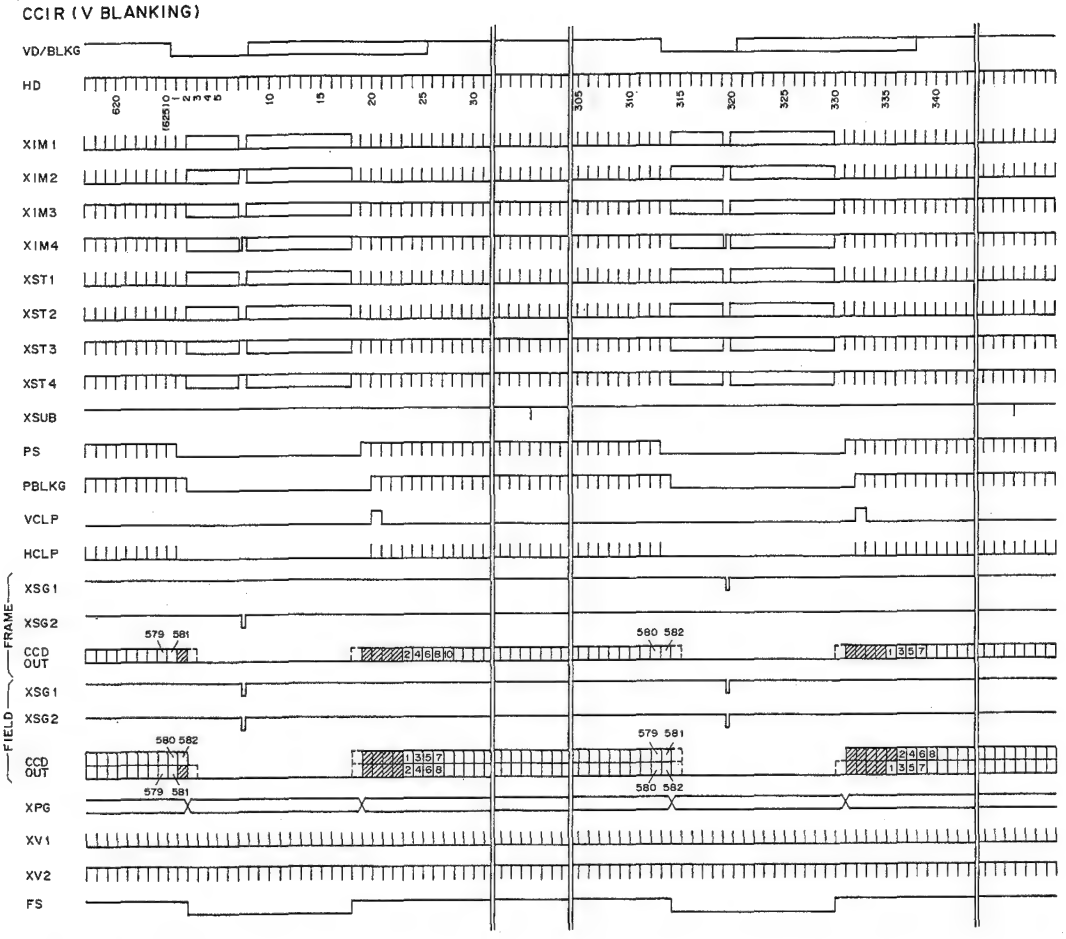
EIA (V BLANKING)



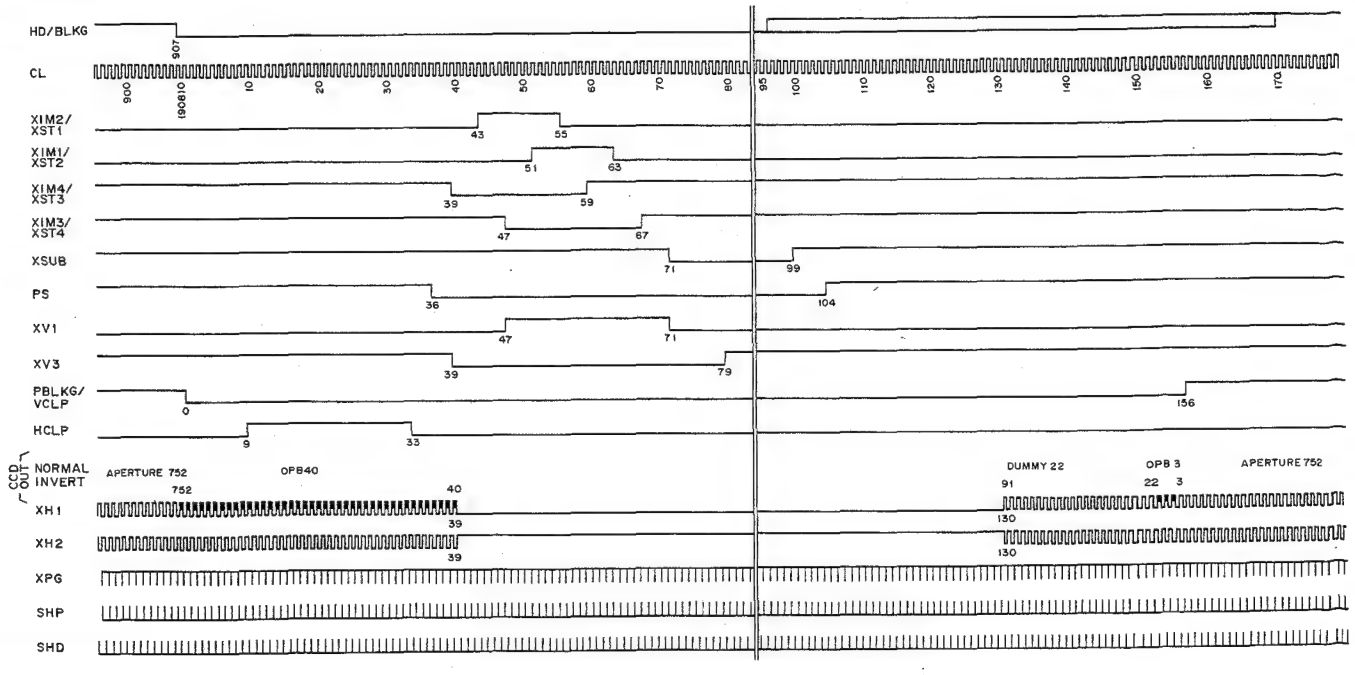
EIA (H BLANKING)



CCIR (V BLANKING)



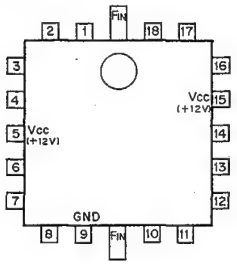
CCIR (H BLANKING)

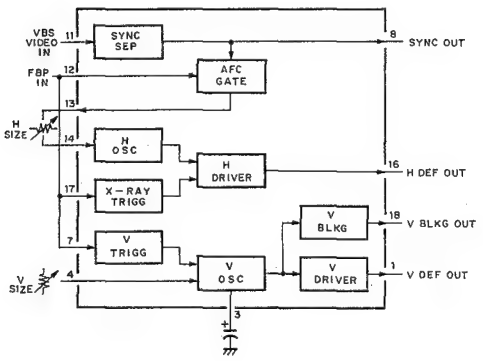


HA11423MP (HITACHI) FLAT PACKAGE

TV H/V SYNC SIGNAL PROCESSOR

– TOP VIEW –



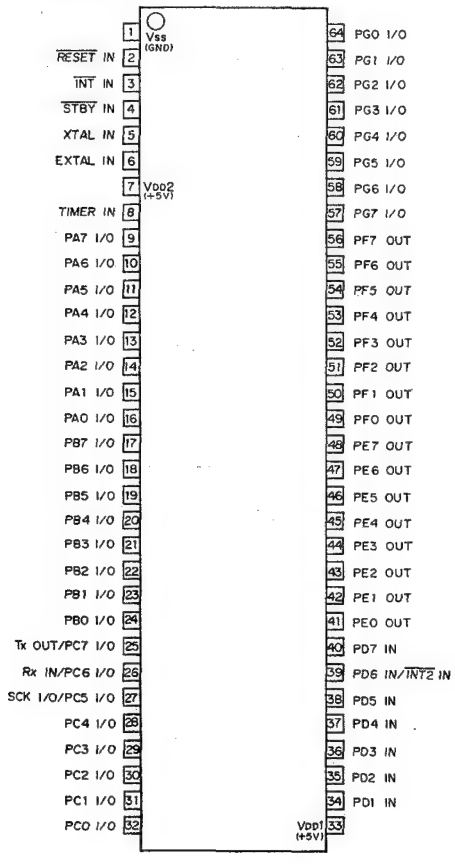


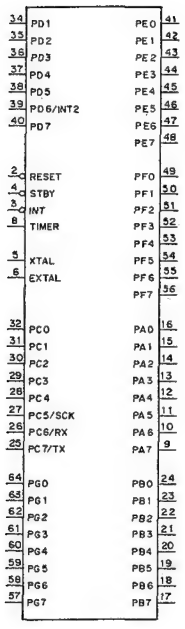
HD6305Y0D25P (HITACHI)

(INSTRUCTION CYCLE = 1uS ; f_{OX} = 4MHz)

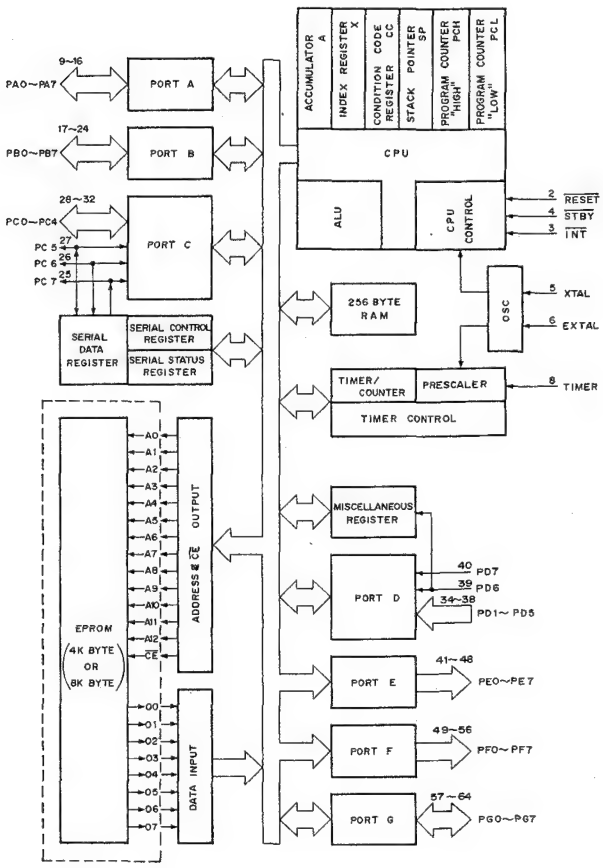
C-MOS 8-BIT MICROPROCESSOR UNIT

– TOP VIEW –





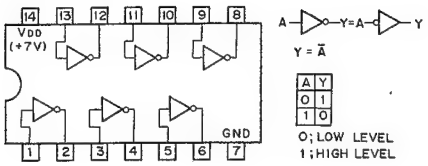
PA0 ~ PA7	8-BIT I/O PORT A
PB0 ~ PB7	8-BIT I/O PORT B
PC0 ~ PC7	8-BIT I/O PORT C
PD1 ~ PD7	7-BIT IN PORT D
PE0 ~ PE7	8-BIT OUT PORT E
PF0 ~ PF7	8-BIT OUT PORT F
PG0 ~ PG7	8-BIT I/O PORT G
RESET	RESET IN
STBY	STANDBY IN
INT	INTERRUPT IN
INT2	INTERRUPT IN
TIMER	TIMER CONTROL IN
TIMER2	TIMER CONTROL IN
XTAL	CRYSTAL
EXTAL	EXTERNAL CRYSTAL IN
SCK	SERIAL INTERFACE CLOCK I/O
RX	SERIAL DATA RECEIVE
TX	SERIAL DATA TRANSMIT



HD74AC04P-R (HITACHI)

C-MOS INVERTER

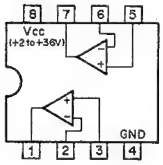
– TOP VIEW –



LM2903M (RAYTHEON) FLAT PACKAGE

VOLTAGE COMPARATOR

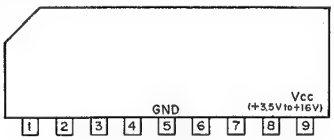
– TOP VIEW –

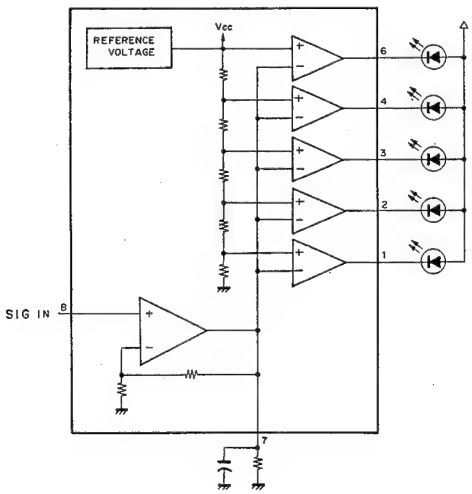


LB1423N (SANYO)

LED DRIVER FOR AC/DC LEVEL METER

– SIDE VIEW –

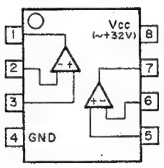




LM2904M (NSC) FLAT PACKAGE

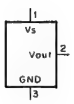
OPERATIONAL AMPLIFIER

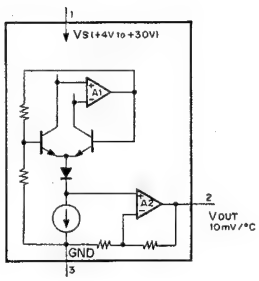
– TOP VIEW –



LM35DZ (NATIONAL)

BIPOLAR TEMPERATURE SENSOR

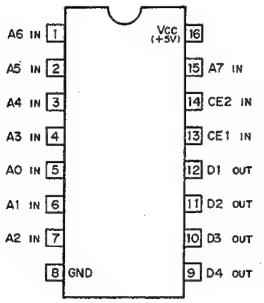


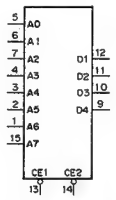


MB7114LPF (FUJITSU) (ACCESS TIME = 50nS) FLAT PACKAGE

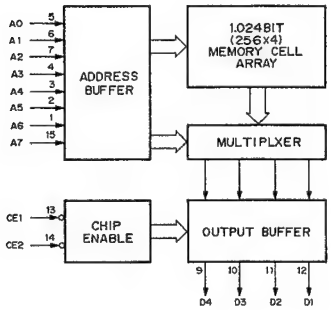
1024-BIT (256x4) PROM

– TOP VIEW –





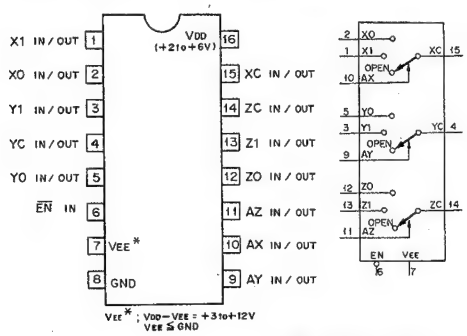
A0–A7 ;ADDRESS INPUTS
D1–D4 ;DATA OUTPUTS
CE1,CE2 ;CHIP ENABLE INPUTS



MC74HC4053F (MOTOROLA) FLAT PACKAGE

C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER

– TOP VIEW –



VEE* ; VDD–VEE = +3to+12V
VEE ≦ GND

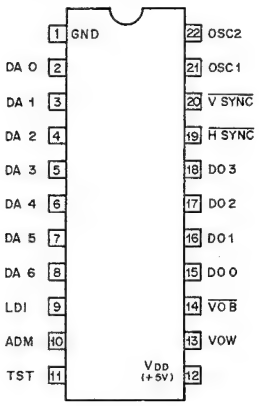
CONT. INPUTS		ON
$\overline{EN}$	A (X,Y,Z,)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

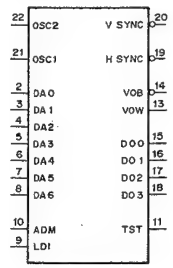
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

MN1237AD (MATSUSHITA)

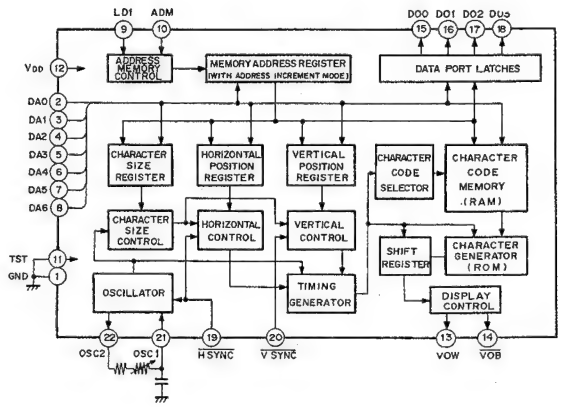
C-MOS INDICATES DATA OF 60 CHARACTERS CRT INTERFACE

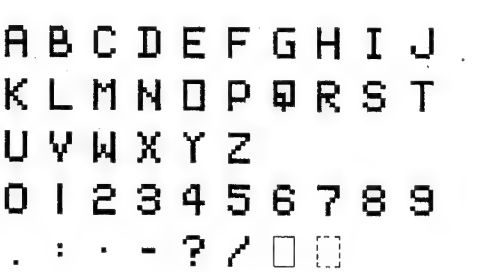
– TOP VIEW –





ADM ; ADDRESS MODE SELECT IN
DA0~DA6 ; DATA BUS INPUT
DO0~DO3 ; GENERAL OUTPUT
H SYNC ; H SYNC INPUT
LDI ; STROBE PULSE INPUT
OSC1,2 ; OSC
TST ; TEST
VOB ; BACKGROUND OUTPUT
VOW ; CHARACTERS OUTPUT
V SYNC ; V SYNC INPUT

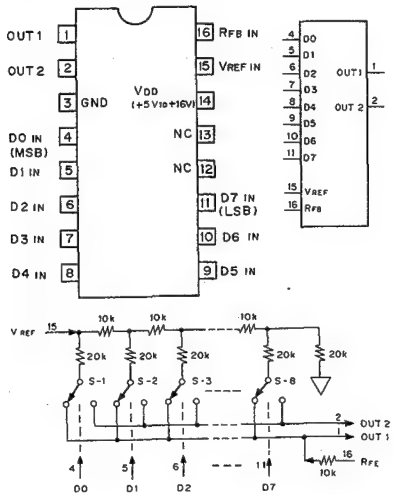




MP7523JN (MICRO POWER SYSTEMS)

C-MOS 8-BIT D/A CONVERTER

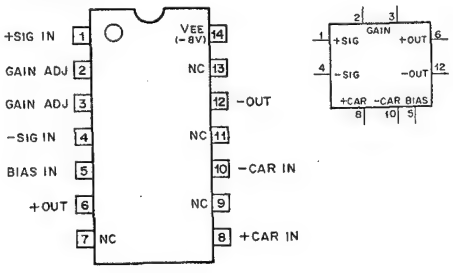
– TOP VIEW –



RC1496M (RAYTHEON) FLAT PACKAGE

BALANCED MODULATOR/DEMODULATOR

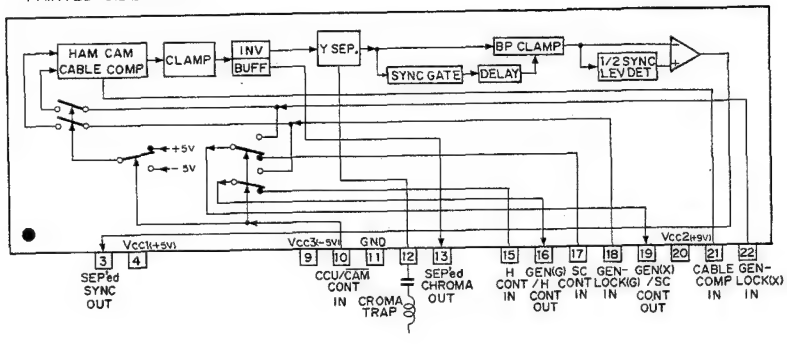
– TOP VIEW –



SBX1516 (SONY)

SYNC SEPARATOR

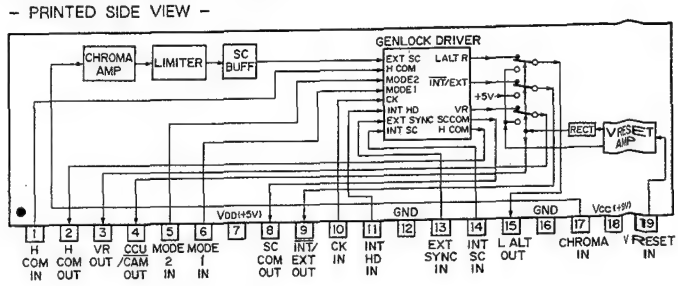
– PRINTED SIDE VIEW –



SBX1525 (SONY)

SC LIMITER AND GENLOCK DRIVER

– PRINTED SIDE VIEW –



MODE SELECTION

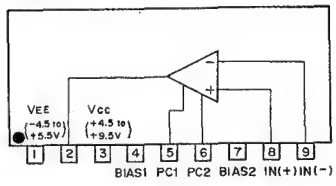
MODE1	MODE2	MODE
1	1	NTSC
0	0	PAL

0 ; LOW LEVEL
1 ; HIGH LEVEL

SBX1588 (SONY)

VIDEO AMPLIFIRE

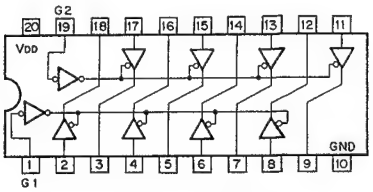
– SIDE VIEW –

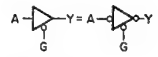


SN74HC244NS (TI) (V_{DD} = + 2 to + 6V) FLAT PACKAGE

C-MOS BUS BUFFER WITH 3-STATE OUTPUTS

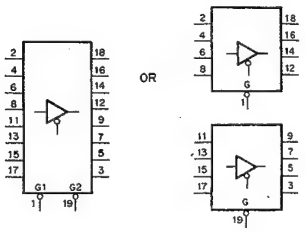
– TOP VIEW –





G	A	Y
0	0	0
0	1	1
1	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

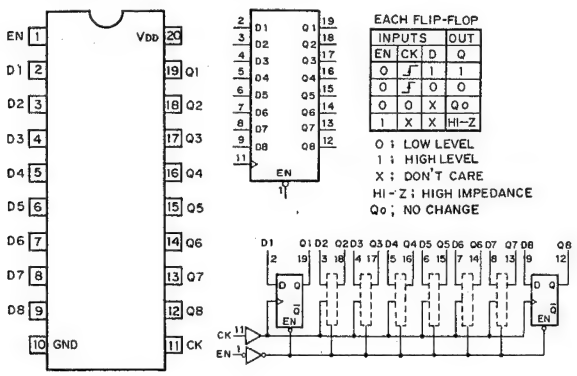


SN74HC574NS (TI) (V_{DD} = + 2 to + 6V) FLAT PACKAGE

TC74HC574F (TOSHIBA) (V_{DD} = + 2 to + 6V) FLAT PACKAGE

C-MOS 3-STATE D-TYPE EDGE-TRIGGERED FLIP-FLOP

– TOP VIEW –



EACH FLIP-FLOP

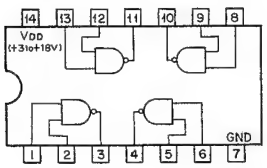
INPUTS			OUT
EN	CK	D	Q
0	↑	1	1
0	↑	0	0
0	0	X	Q0
1	X	X	HI-Z

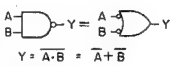
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE
Q0 ; NO CHANGE

TC4011BF (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND GATE

– TOP VIEW –





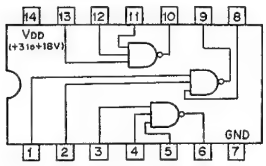
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

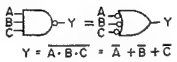
0:LOW LEVEL
1:HIGH LEVEL

TC4023BF (TOSHIBA) FLAT PACKAGE

C-MOS 3-INPUT NAND GATE

– TOP VIEW –





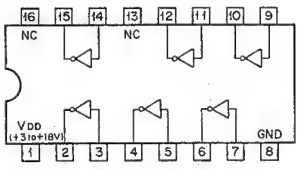
A	B	C	Y
X	X	0	1
X	0	X	1
0	X	X	1
1	1	1	0

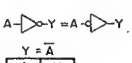
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC4049BF (TOSHIBA) FLAT PACKAGE

C-MOS INVERTING TYPE BUFFER/CONVERTER

– TOP VIEW –





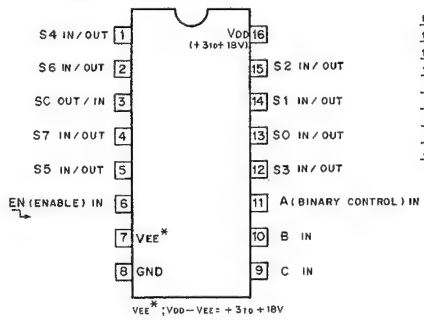
A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

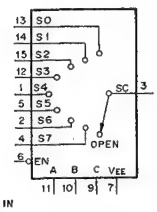
TC4051BFHB (TOSHIBA) FLAT PACKAGE

C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER

– TOP VIEW –



VEE* ; VDD – VEE = + 3 to + 18V



EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

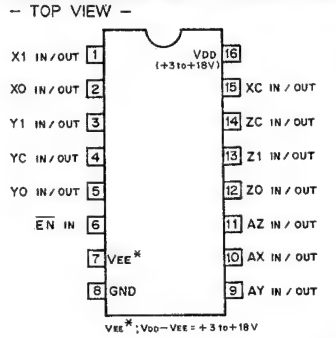
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC4053BF (TOSHIBA) FLAT PACKAGE

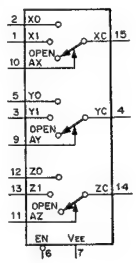
TC4053BFHB (TOSHIBA) FLAT PACKAGE

C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER

– TOP VIEW –



VEE* ; VDD – VEE = + 3 to + 18 V



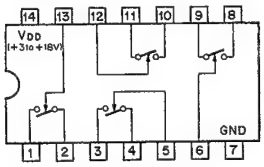
CONT. INPUTS		ON
EN	A (X,Y,Z,)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

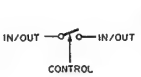
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

TC4066BFHB (TOSHIBA) FLAT PACKAGE

C-MOS BILATERAL ANALOG SWITCH

– TOP VIEW –





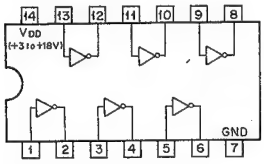
CONTROL	SWITCH
0	OFF
1	ON

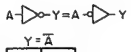
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4069UBF (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER

– TOP VIEW –





$Y = \overline{A}$

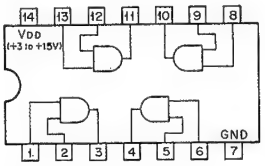
A	Y
0	1
1	0

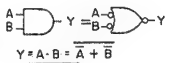
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4081BF (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT AND GATE

– TOP VIEW –





$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

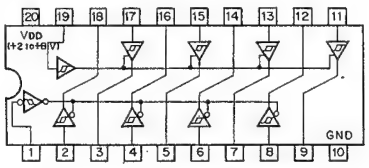
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

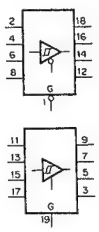
0 ; LOW LEVEL
1 ; HIGH LEVEL

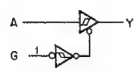
TC40H241F (TOSHIBA) FLAT PACKAGE

C-MOS 3-STATE SCHMITT TRIGGER BUFFER/LINE DRIVER

– TOP VIEW –

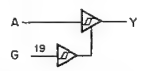






G	A	Y
0	0	0
0	1	1
1	0	HI-Z
1	1	HI-Z

HI-Z ;
HIGH IMPEDANCE



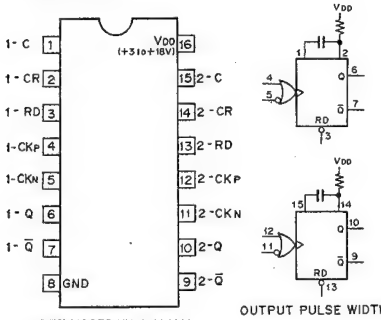
G	A	Y
0	0	HI-Z
0	1	HI-Z
1	0	0
1	1	1

HI-Z ;
HIGH IMPEDANCE

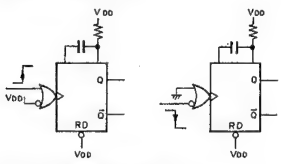
TC4538BF (TOSHIBA) FLAT PACKAGE
TC74HC4538F (TOSHIBA) FLAT PACKAGE

C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR

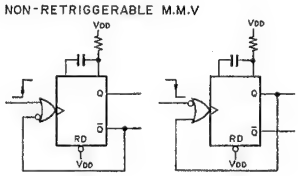
– TOP VIEW –



RETRIGGERABLE M.M.V



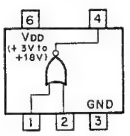
NON-RETRIGGERABLE M.M.V

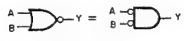


TC4S01F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NOR GATE

– TOP VIEW –





$Y = \overline{A + B} = \overline{A} \cdot \overline{B}$

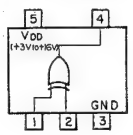
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4S30F (TOSHIBA) FLAT PACKAGE

C-MOS EXCLUSIVE OR GATE

– TOP VIEW –



$Y = \overline{A} \cdot B + A \cdot \overline{B}$

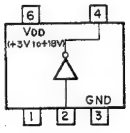
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

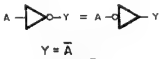
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4S69F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER BUFFER

– TOP VIEW –





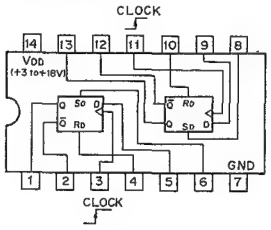
$Y = \overline{A}$

A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TC504013BF (TOSHIBA) FLAT PACKAGE

C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
– TOP VIEW –



DIRECT R-S FLIP FLOP			
Sp	Rp	Q	$\overline{Q}$
0	0	On	$\overline{On}$
0	1	0	1
1	0	1	0
1	1	0	1

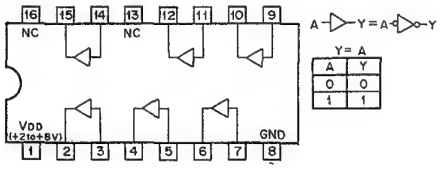
D-TYPE FLIP FLOP	
CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK; ↓ CKn; BEFORE CLOCK
CKn+1; AFTER CLOCK

0; LOW LEVEL
1; HIGH LEVEL

TC50H001F (TOSHIBA) FLAT PACKAGE

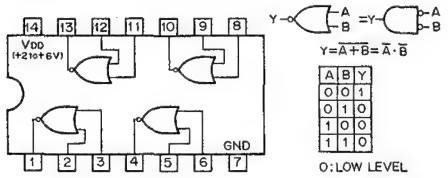
C-MOS NON-INVERTING TYPE BUFFER/CONVERTER
– TOP VIEW –



Y = A	
A	Y
0	0
1	1

TC74HC02F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT POSITIVE-NOR GATE
– TOP VIEW –

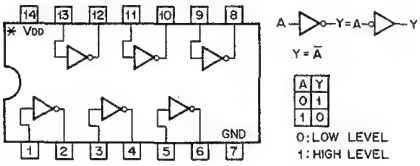


A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

TC74HC04F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER
– TOP VIEW –



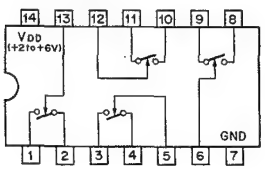
Y = $\overline{A}$	
A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

* VDD HC, HCU; +2 to +6V
HCT; +5V

TC74HC4066F (TOSHIBA) FLAT PACKAGE

C-MOS BILATERAL ANALOG SWITCH
– TOP VIEW –

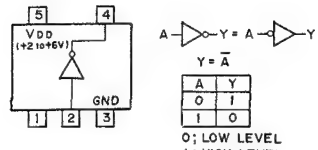


CONTROL	SWITCH
0	OFF
1	ON

0; LOW LEVEL
1; HIGH LEVEL

TC7S04F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER
– TOP VIEW –

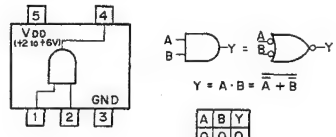


A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

TC7S08F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT AND GATE
– TOP VIEW –

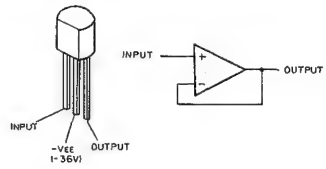


A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0; LOW LEVEL
1; HIGH LEVEL

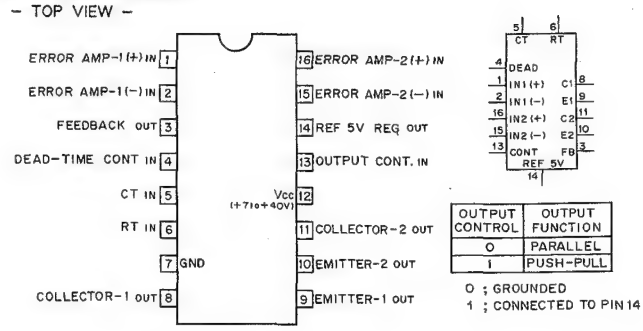
TL068CLP (TI)

J-FET INPUT BUFFER AMPLIFIER



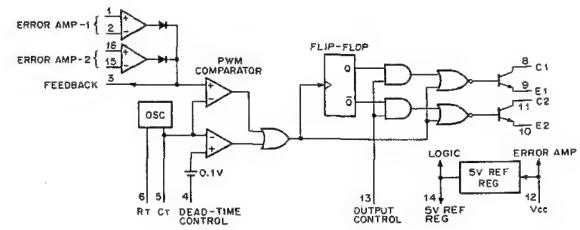
TL494CNS (TI) FLAT PACKAGE

PWM POWER CONTROL
– TOP VIEW –

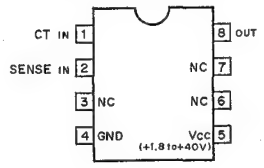


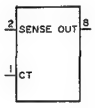
OUTPUT CONTROL	OUTPUT FUNCTION
0	PARALLEL
1	PUSH-PULL

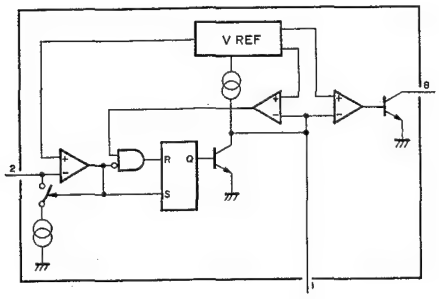
0 ; GROUNDED
1 ; CONNECTED TO PIN 14



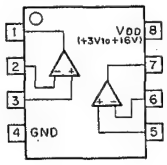
TL7700CPS (TI) FLAT PACKAGE
VARIABLE SUPPLY VOLTAGE SUPERVISOR
– TOP VIEW –



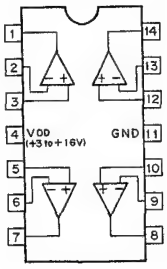




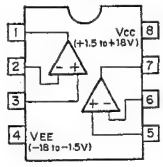
TLC27L2CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
– TOP VIEW –



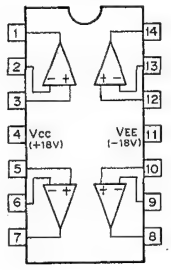
TLC27L4CNS (TI) FLAT PACKAGE
C-MOS OPERATIONAL AMPLIFIER
– TOP VIEW –



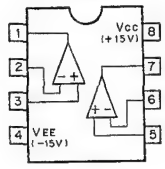
TL062CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(JFET INPUT)
– TOP VIEW –



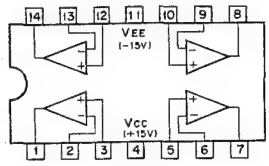
TL064CNS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –



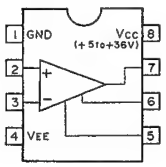
TL082CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –



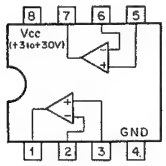
TL084CNS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –



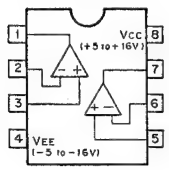
uPC311G2 (NEC) FLAT PACKAGE
VOLTAGE COMPARATOR
– TOP VIEW –



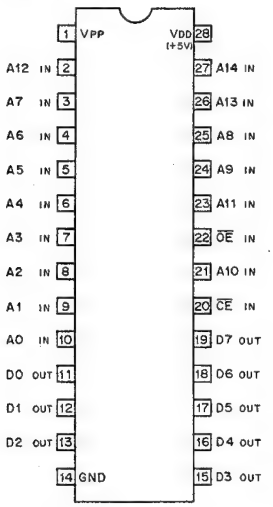
uPC358G2 (NEC) FLAT PACKAGE
DUAL OPERATIONAL AMPLIFIERS
– TOP VIEW –

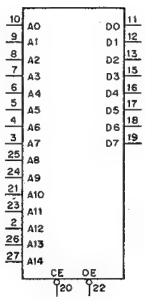


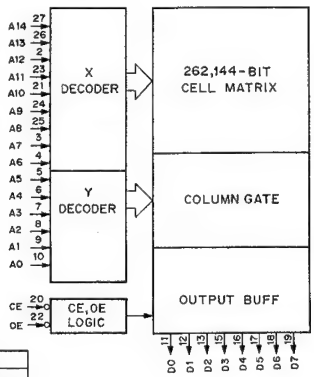
uPC812G2 (NEC) FLAT PACKAGE
OPERATIONAL AMPLIFIER (JFET INPUT)
– TOP VIEW –



uPD27C256AG-15 (NEC) (ACCESS TIME = 150nS) FLAT PACKAGE
C-MOS 256K (32K-8) ONE TIME PROM
– TOP VIEW –







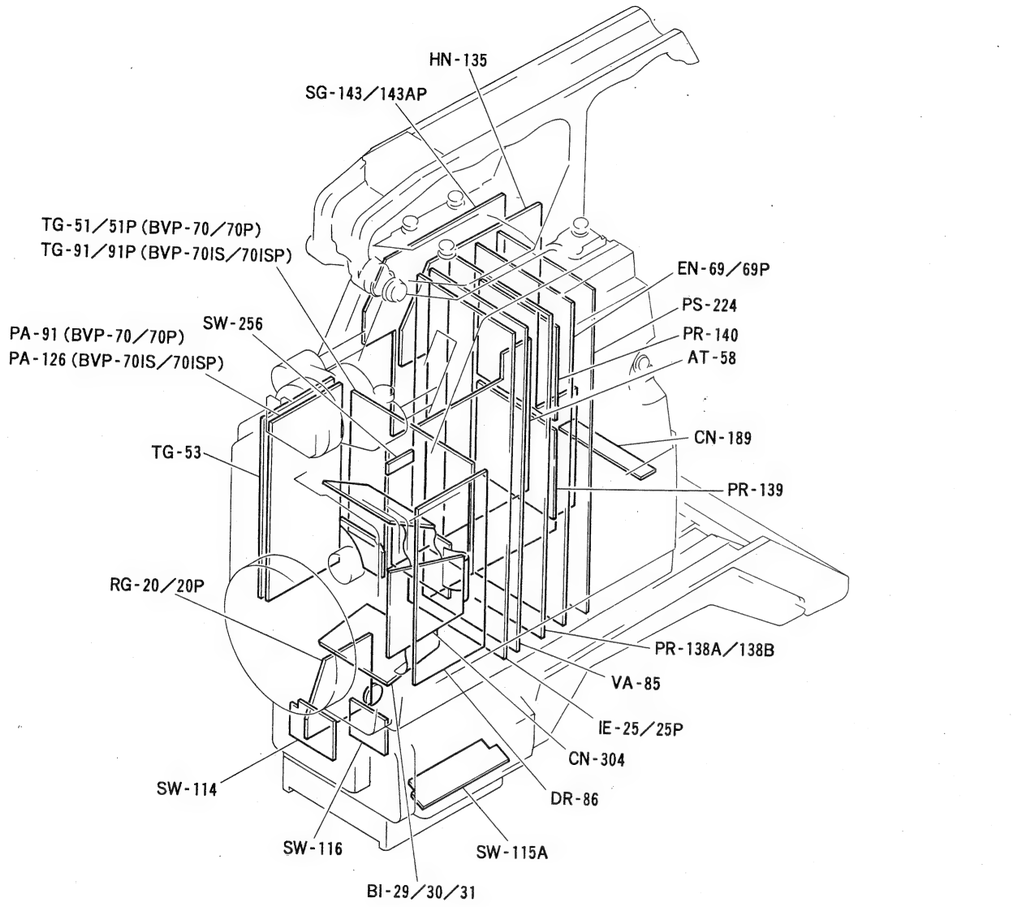
AO–A14 ; ADDRESS
$\overline{CE}$; CHIP ENABLE
DO–D7 ; DATA OUTPUT
$\overline{OE}$; OUTPUT ENABLE
Vpp ; PROGRAM POWER SUPPLY

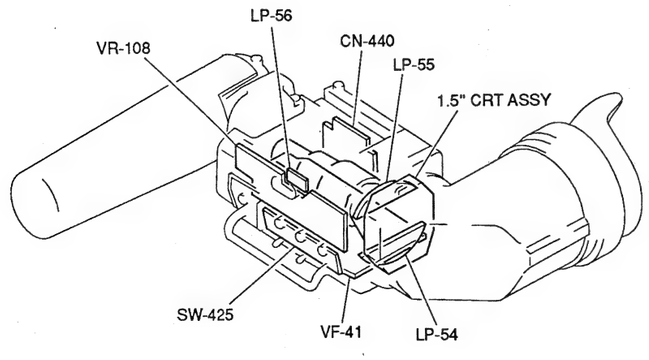
An	$\overline{CE}$	$\overline{OE}$	Vpp	Dn	FUNCTION
An	0	0	+5V	D OUT	READ
An	0	1	+5V	HI-Z	OUTPUT DISABLE
X	1	X	+5V	HI-Z	STANDBY
An	0	1	+12.5V	DIN	PGM
An	1	0	+12.5V	D OUT	PGM VERIFY
X	1	1	+12.5V	HI-Z	PGM INH

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE

SECTION C
SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

BOARD LAYOUT





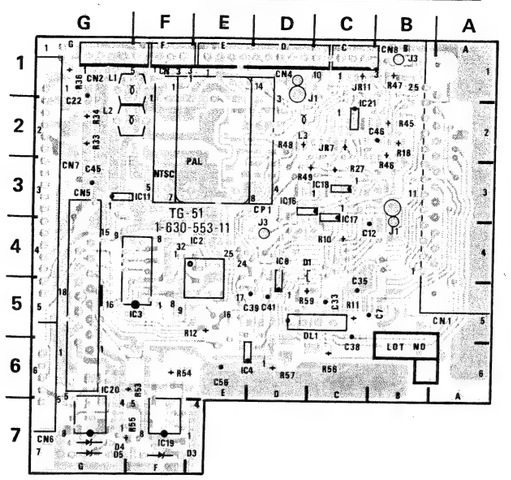
CCD BLOCK (1/2) TG-51/51P DR-86

TG-51/51P BOARD

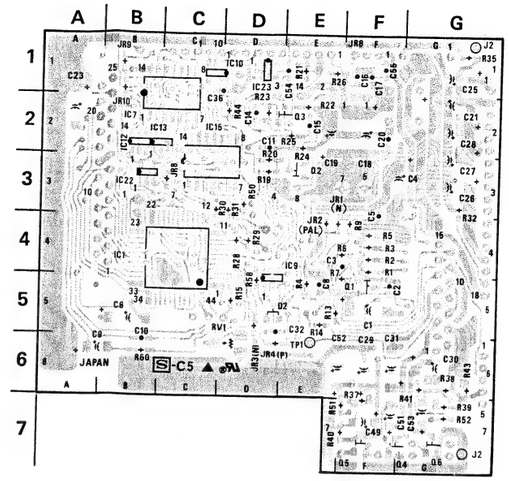
Ser No.10221-11060 (UC)
30356-31100 (J)
40386-41075 (EK)

TG-51/51P (1-630-553-11)

CN1	A - 5	Q1	F - 5
CN2	G - 1	Q2	E - 3
CN3	F - 1	Q4	G - 7
CN4	D - 1	Q5	F - 7
CN5	G - 3	Q6	G - 7
CN6	G - 7		
CN7	G - 3	RV1	D - 6
CN8	A - 1		
CP1	D - 3		
D1	D - 4		
D2	D - 5		
D3	E - 7		
D4	G - 7		
D5	G - 7		
DL1	C - 5		
IC1	B - 4		
IC2	E - 4		
IC3	F - 5		
IC4	D - 6		
IC7	B - 2		
IC8	D - 4		
IC9	D - 5		
IC10	C - 1		
IC11	G - 3		
IC12	B - 2		
IC13	B - 2		
IC15	C - 3		
IC16	D - 3		
IC17	C - 2		
IC18	C - 2		
IC19	F - 7		
IC20	G - 7		
IC21	C - 2		
IC22	B - 3		
IC23	D - 1		



1-630-553-11 SOLDERING SIDE

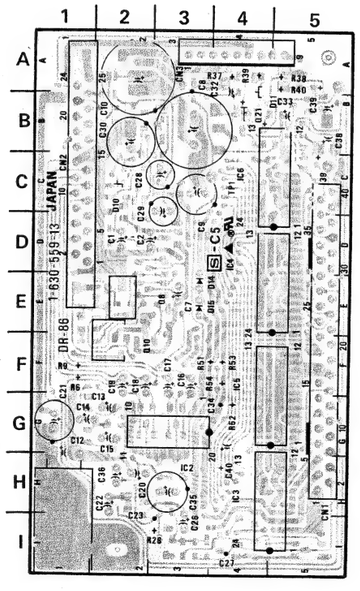


1-630-553-11 SOLDERING SIDE

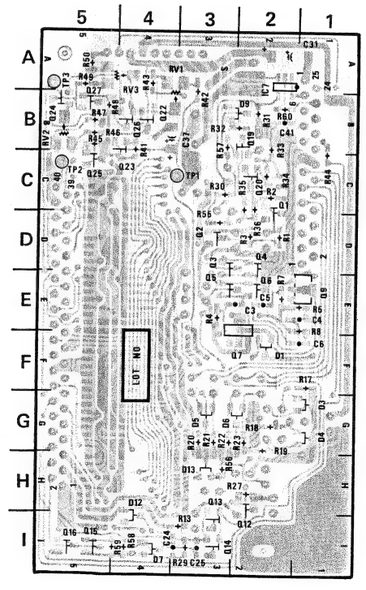
DR-86 BOARD

DR-86 (1-630-559-13)

CN1	H - 5	Q1	C - 2
CN2	C - 1	Q2	D - 3
CN3	A - 3	Q3	D - 3
D1	F - 2	Q4	D - 2
D3	G - 1	Q5	E - 3
D4	G - 1	Q6	E - 2
D5	G - 3	Q7	F - 2
D6	G - 3	Q8	E - 3
D7	I - 4	Q9	E - 1
D9	B - 2	Q10	F - 2
D10	C - 2	Q12	I - 2
D11	B - 4	Q13	H - 3
D12	H - 4	Q14	I - 3
D13	H - 3	Q15	I - 5
D14	E - 3	Q16	I - 5
D15	E - 3	Q19	B - 2
IC2	H - 3	Q20	C - 2
IC3	H - 4	Q21	B - 4
IC4	D - 4	Q22	B - 4
IC5	F - 4	Q23	C - 4
IC6	C - 4	Q24	B - 5
IC7	A - 2	Q25	C - 5
		Q26	B - 4
		Q27	A - 5
		RV1	A - 4
		RV2	B - 5
		RV3	A - 4



1-630-559-13 SOLDERING SIDE



1-630-559-13 SOLDERING SIDE

CCD BLOCK (1/2) TG-51/51P DR-86

TG-51 (1-630-553-12)

CN1	A - 5	JR1	E - 3
CN2	G - 1	JR3	D - 6
CN3	F - 1	JR7	C - 2
CN4	D - 1	JR8	C - 3
CN5	G - 3	JR9	B - 1
CN6	G - 7	JR11	C - 1
CN7	G - 3		
CN8	B - 1	Q1	F - 5
		Q2	E - 3
CP1	D - 3	Q3	E - 2
		Q4	G - 7
D1	D - 4	Q5	F - 7
D2	D - 5	Q6	G - 7
D3	E - 7		
D4	G - 7	RV1	D - 5
D5	G - 7		
		TP1	E - 6
DL1	C - 5		
IC1	B - 4		
IC2	E - 4		
IC4	D - 6		
IC7	B - 2		
IC8	D - 4		
IC9	E - 5		
IC10	D - 1		
IC11	F - 3		
IC12	B - 2		
IC13	B - 2		
IC15	C - 2		
IC16	D - 3		
IC17	C - 3		
IC18	C - 3		
IC19	F - 7		
IC20	G - 6		
IC21	C - 2		
IC22	B - 3		
IC23	D - 1		

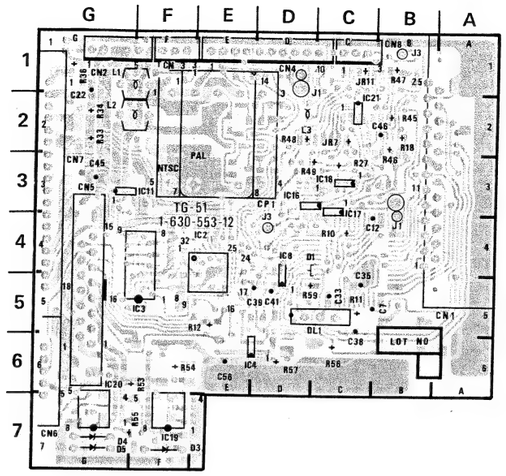
DR-86 (1-630-559-13)

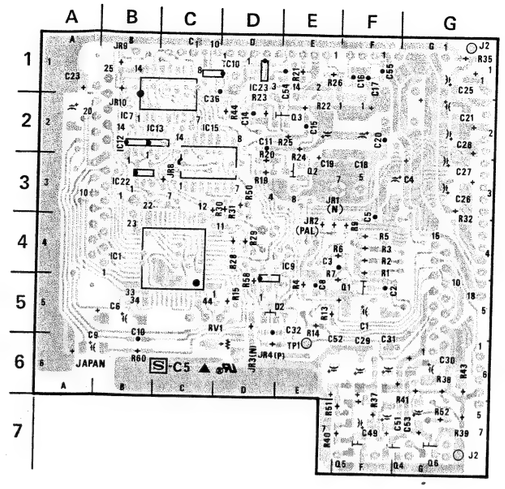
CN1	H - 5
CN2	C - 1
CN3	A - 3
D1	F - 2
D3	G - 1
D4	G - 1
D5	G - 3
D6	G - 3
D7	I - 4
D9	B - 2
D10	C - 2
D11	B - 4
D12	H - 4
D13	H - 3
D14	E - 3
D15	E - 3
IC2	H - 3
IC3	H - 4
IC4	D - 4
IC5	F - 4
IC6	C - 4
IC7	A - 2
Q1	C - 2
Q2	D - 3
Q3	D - 3
Q4	D - 2
Q5	E - 3
Q6	E - 2
Q7	F - 2
Q8	E - 3
Q9	E - 1
Q10	F - 2
Q12	I - 2
Q13	H - 3
Q14	I - 3
Q15	I - 5
Q16	I - 5
Q19	B - 2
Q20	C - 2
Q21	B - 4
Q22	B - 4
Q23	C - 4
Q24	B - 5
Q25	C - 5
Q26	B - 4
Q27	A - 5
RV1	A - 4
RV2	B - 5
RV3	A - 4

TG-51/51P BOARD

Ser No.11061-	BVP-70 (UC)	
31101-	BVP-70 (J)	
41076-	BVP-70P (EK)	

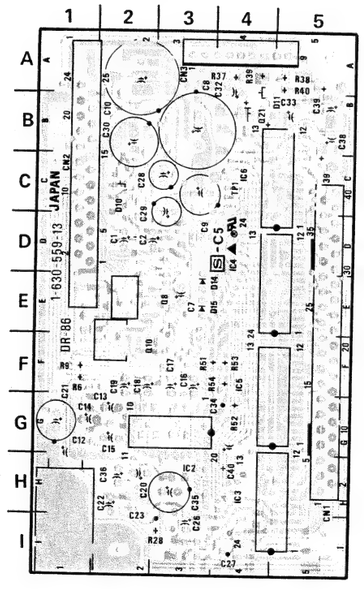
Ser No.11001-11186 BVP-70IS (UC)
31001-31215 BVP-70IS (J)
41001-41262 BVP-70ISP (EK)

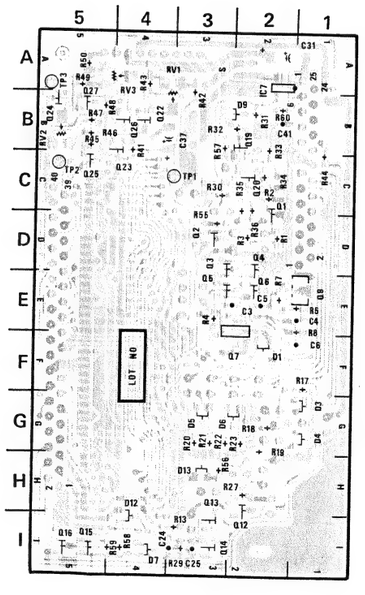




1-630-553-12 SOLDERING SIDE

DR-86 BOARD

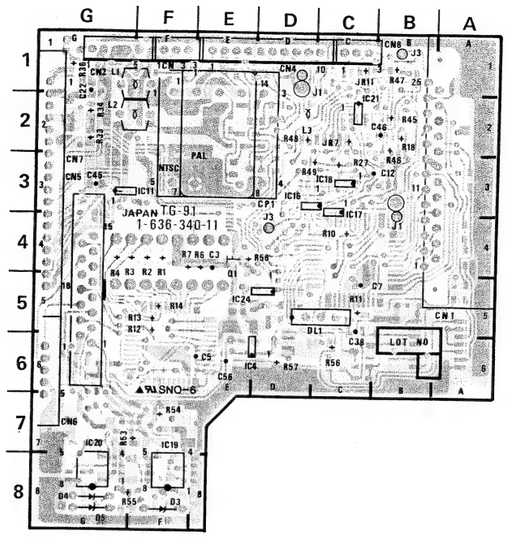




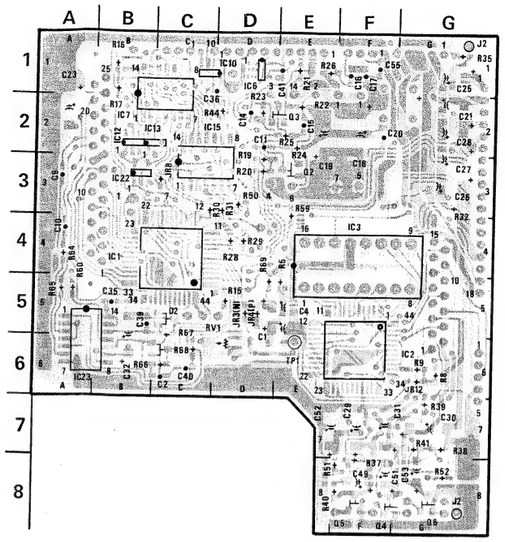
CCD BLOCK (1/2) TG-91/91P DR-86

TG-91/91P BOARD (For BVP-70IS/70ISP)

Ser No.11187-	BVP-70IS (UC)
31216-	BVP-70IS (J)
41263-	BVP-70ISP (EK)



1-636-340-11 SOLDERING SIDE

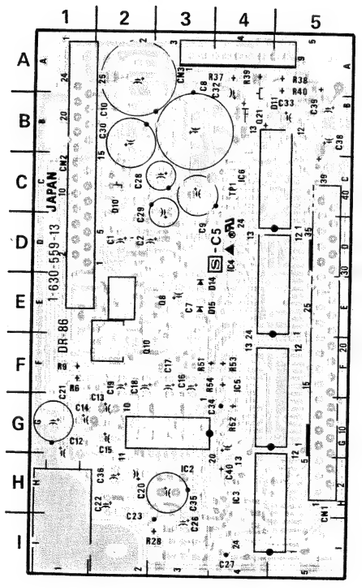


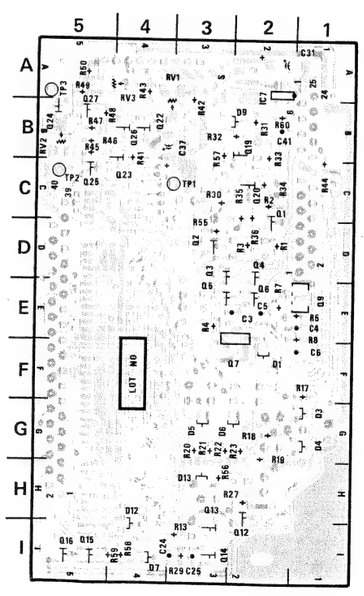
1-636-340-11 SOLDERING SIDE

TG-91 (1-636-340-11)

CN1	A - 5	JR3	D - 5
CN2	G - 1	JR7	C - 2
CN3	F - 1	JR8	C - 3
CN4	D - 1	JR11	C - 1
CN5	G - 3	JR12	G - 6
CN6	G - 7		
CN7	G - 3	Q1	E - 4
CN8	B - 1	Q2	E - 3
		Q3	E - 2
CP1	D - 3	Q4	F - 8
		Q5	F - 8
DL1	C - 5	Q6	G - 8
D2	C - 5	RV1	C - 5
D3	F - 8		
D4	G - 8	TP1	E - 6
D5	G - 8		
D6	C - 6		
IC1	B - 4		
IC2	G - 6		
IC4	D - 6		
IC6	D - 1		
IC7	B - 2		
IC10	D - 1		
IC11	F - 3		
IC12	B - 2		
IC13	B - 2		
IC15	C - 2		
IC16	D - 3		
IC17	C - 3		
IC18	C - 3		
IC19	F - 7		
IC20	G - 7		
IC21	C - 2		
IC22	B - 3		
IC23	A - 6		
IC24	E - 5		

DR-86 BOARD





DR-86 (1-630-559-13)

CN1	H - 5	D3	G - 1
CN2	C - 1	D4	G - 1
CN3	A - 3	D5	G - 3
		D6	G - 3
D1	F - 2	D7	I - 4
D3	G - 1	D9	B - 2
D4	G - 1	D10	C - 2
D5	G - 3	D11	B - 4
D6	G - 3	D12	H - 4
D7	I - 4	D13	H - 3
D9	B - 2	D14	E - 3
D10	C - 2	D15	E - 3
D11	B - 4		
D12	H - 4	IC2	H - 3
D13	H - 3	IC3	H - 4
D14	E - 3	IC4	D - 4
D15	E - 3	IC5	F - 4
		IC6	C - 4
IC2	H - 3	IC7	A - 2
IC3	H - 4		
IC4	D - 4	Q1	C - 2
IC5	F - 4	Q2	D - 3
IC6	C - 4	Q3	D - 3
IC7	A - 2	Q4	D - 2
		Q5	E - 3
Q1	C - 2	Q6	E - 2
Q2	D - 3	Q7	F - 2
Q3	D - 3	Q8	E - 3
Q4	D - 2	Q9	E - 1
Q5	E - 3	Q10	F - 2
Q6	E - 2	Q12	I - 2
Q7	F - 2	Q13	H - 3
Q8	E - 3	Q14	I - 3
Q9	E - 1	Q15	I - 5
Q10	F - 2	Q16	I - 5
Q12	I - 2	Q19	B - 2
Q13	H - 3	Q20	C - 2
Q14	I - 3	Q21	B - 4
Q15	I - 5	Q22	B - 4
Q16	I - 5	Q23	C - 4
Q19	B - 2	Q24	B - 5
Q20	C - 2	Q25	C - 5
Q21	B - 4	Q26	B - 4
Q22	B - 4	Q27	A - 5
Q23	C - 4		
Q24	B - 5	RV1	A - 4
Q25	C - 5	RV2	B - 5
Q26	B - 4	RV3	A - 4
Q27	A - 5		

CCD BLOCK (1/2) TG-51/51P DR-86

CCD BLOCK (1/2)
TG-51/51P BOARD
DR-86 BOARD

TG-51 Board
*Ser.No 11061- BVP-70 (UC)
31101- BVP-70 (J)
41076- BVP-70P (EK)

Ser.No 11001-11186 BV-701S (UC)
31001-31215 BVP-701S (J)
41001-41262 BVP-701SP (EK)

TG-53 BOARD

TG-51 BOARD

IC1 CXD8002 IC8 TC7S08F IC2 CXD1251Q IC3 MB7114LPF Q1 2SA812 IC4 TC7S08F IC9 TC7S08F IC23 TC7S08N IC11 TC4S30F IC7 TC4023BF IC15 TC4066BF IC21 TC7S08F

RV1: SAMPLE WIDTH

IC20 TLC27L2 Q6 2SB624 Q4 2SB624 IC19 TLC27L2 Q5 2SB624

CP1 NTSC:2863636 PAL:2950000 Q2 2SC1009A Q3 2SC1009A

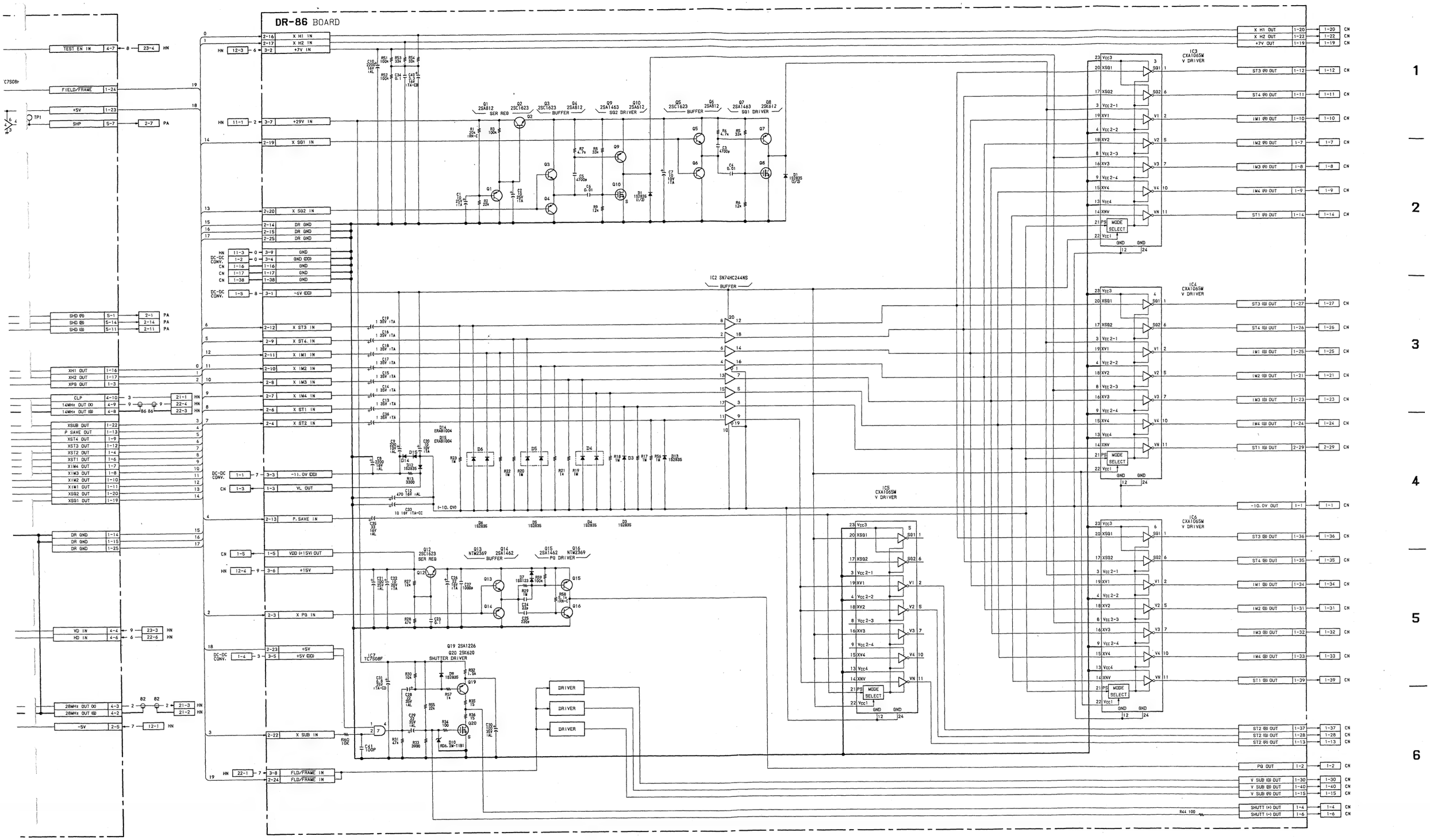
C-5 (A)

C-6 (A)

BVP-70 (J, UC)
BVP-70P (EK)

A | B | C | D | E | F | G

CCD BLOCK (1/2) TG-51/51P DR-86



C-7 (A)

C-8 (A)

B-BVP70-CCDBLOCK/M#1

CCD BLOCK (1/2) TG-91/91P DR-86

CCD BLOCK (1/2)

TG-91/91P BOARD
DR-86 BOARD

TG-91 Board

Ser. No 11187~ BVP-701S (UC)
31216~ BVP-701S (J)
41263~ BVP-701SP (EK)

TG-53 BOARD

TG-91 BOARD

IC1 CXD8002 IC2 CXD8095Q IC3 MB7116E Q1 2SA812 IC4 TC7S08F IC6 TC7S08F IC7 MC14023BF IC10 TC4S30F IC11 TC4S30F IC12 TC4S30F IC13 TC4S30F IC15 MC14066BF IC16 TC4S30F IC17 TC4S30F IC18 TC4S30F IC19 TLC27L2CPS IC20 TLC27L2CPS IC21 TC7S08F IC22 TC4S30F IC24 TC7S08F IC14 74AC08SJ

RV1: SAMPLE WIDTH

Q2 2SC1009A Q3 2SC1009A Q4 2SB624 Q5 2SB624 Q6 2SB624

CP1 NTSC:2863636 PAL:28.375

+8.6V	1-1	TEMP +5V	3-2
-5V	1-2	TEMP GND	5-3
GND (A)	1-3	TEMP DO OUT	3-1
+5V (A)	1-4	TEMP DO	7-18
-5V (A)	1-5	TEMP GND	7-17
GND (ROM)	1-6	FIELD/ FRAME	7-11
VD	1-7	FLD IN	22-2 / 4-5
HD	1-8	+5V (ROM)	7-15
FL	1-9	+5V (D)	7-5
S2	1-10	+5V (A)	7-4
FIELD/ FRAME	1-11	GND (ROM)	7-6
S1	1-12	GND (D)	7-14
SO	1-13	GND (A)	7-3
GND (D)	1-14		
+5V (ROM)	1-15		
CLK DO	1-16		
TEMP GND	1-17		
TEMP DO	1-18		

W.C.P. (G)	5-1	AT	3-3 / 8-3 / B-7
GND	5-2	AT	3-2 / 8-2 / B-6
W.C.P. (B)	5-3	AT	3-1 / 8-1 / B-5
GND	5-4	HN	21-11 / 2-1 / +8.8V
W.C.P. (R)	5-5		7-1 / +8.6V

PA	2-6 / 5-15	GND	5-6
		GND	6-2
		GND	6-4
		W.C.P. (R)	6-5
		W.C.P. (G)	6-1
		W.C.P. (B)	6-3
PA	2-12	W.C.P. (B)	5-12
PA	2-6	W.C.P. (G)	5-6
PA	2-3	W.C.P. (R)	5-3
PA	2-13	+8.6V (B)	5-13
PA	2-9	GND (B)	5-9
PA	2-7	+8.6V (G)	5-7
PA	2-4	GND (R)	5-4
PA	2-2	+8.6V (R)	5-2
		FL	7-9
		SO	7-13
		S1	7-12
		S2	7-10
		VD	7-7
		HD	7-8
		CLK DO	7-16
PA	2-10	+5V	5-10
HN	22-5	28MHz VCO CONT IN	4-1
HN	21-12	GND (PW)	2-3
HN	21-13	GND (REF)	2-4
		-5V	7-2

		TEST EN IN	4-7
		FIELD/FRAME	1-24
		+5V	2-2
		+5V	1-23
		SHP	5-1
		P DATA (R)	5-4
		P DATA (G)	5-5
		P DATA (B)	5-14
		XH1 OUT	1-16
		XH2 OUT	1-17
		XPG OUT	1-3
		SHD	5-11
		CLP	4-10
		14MHz OUT (G)	4-9
		14MHz OUT (B)	4-8
		XSUB OUT	1-22
		P SAVE OUT	1-13
		XST4 OUT	1-9
		XST3 OUT	1-12
		XST2 OUT	1-4
		XST1 OUT	1-6
		XIM4 OUT	1-7
		XIM3 OUT	1-8
		XIM2 OUT	1-10
		XIM1 OUT	1-11
		XSG2 OUT	1-20
		XSG1 OUT	1-19
		DR GND	1-14
		DR GND	1-15
		DR GND	1-25
		VD IN	4-4
		HD IN	4-6
		28MHz OUT (G)	4-3
		28MHz OUT (B)	4-2
		-5V	2-5

C-5 (B)

C-6 (B)

BVP-701S (J, UC)
BVP-701SP (EK)

A | B | C | D | E | F | G

CCD BLOCK (1/2) TG-91/91P
DR-86

DR-86 BOARD

TEST EN IN 4-7 ← 8 — 23-4 HN
FIELD/FRAME 1-24
+5V 2-2 ← 4 — 12-2 HN
+5V 1-23
SHP 5-1 — 2-1 PA
P DATA (R) 5-4 — 2-4 PA
P DATA (G) 5-8 — 2-8 PA
P DATA (B) 5-14 — 2-14 PA
XH1 OUT 1-16
XH2 OUT 1-17
XPG OUT 1-3
SHD 5-11 — 2-11 PA
CLP 4-10 — 21-1 HN
14MHz OUT (G) 4-8 — 22-3 HN
XSUB OUT 1-22
P SAVE OUT 1-13
XST4 OUT 1-9
XST3 OUT 1-12
XST2 OUT 1-4
XST1 OUT 1-6
XIM4 OUT 1-7
XIM3 OUT 1-8
XIM2 OUT 1-10
XIM1 OUT 1-11
XSG2 OUT 1-20
XSG1 OUT 1-19
DR GND 1-14
DR GND 1-15
DR GND 1-25
VD IN 4-4 — 23-3 HN
HD IN 4-6 — 22-6 HN
28MHz OUT (G) 4-3 — 21-3 HN
28MHz OUT (B) 4-2 — 21-2 HN
-5V 2-5 — 12-1 HN

HN 12-3 — 3-2 +7V IN
HN 11-1 — 3-7 +29V IN
2-16 X H1 IN
2-17 X H2 IN
2-19 X SG1 IN
2-20 X SG2 IN
2-14 DR GND
2-15 DR GND
2-25 DR GND
DC-DC CONV. 11-3 — 3-9 GND
DC-DC CONV. 1-2 — 3-4 GND (GD)
CN 1-16 — 1-16 GND
CN 1-17 — 1-17 GND
CN 1-38 — 1-38 GND
DC-DC CONV. 1-5 — 3-1 -6V (GD)
2-12 X ST3 IN
2-9 X ST4 IN
2-11 X IM1 IN
2-10 X IM2 IN
2-8 X IM3 IN
2-7 X IM4 IN
2-6 X ST1 IN
2-4 X ST2 IN
DC-DC CONV. 1-1 — 3-3 -11.0V (GD)
CN 1-3 — 1-3 VL OUT
2-13 P.SAVE IN
CN 1-5 — 1-5 VDD (+15V) OUT
HN 12-4 — 3-6 +15V
2-3 X PG IN
DC-DC CONV. 1-4 — 3-5 +5V (GD)
2-23 +5V
2-22 X SUB IN
HN 22-1 — 3-8 FLD/FRAME IN
2-24 FLD/FRAME IN

Q1 2SA812 SER REG
Q2 2SC1623
Q3 2SC1623 BUFFER
Q4 2SA812
Q9 2SA1463 SG2 DRIVER
Q10 2SA812
Q5 2SC1623 BUFFER
Q6 2SA812
Q7 2SA1463 SG1 DRIVER
Q8 2SK612
Q12 2SC1623 SER REG
Q13 NTM2369
Q14 2SA1462 BUFFER
Q15 2SA1462
Q16 NTM2369 PG DRIVER
Q19 2SA1226
Q20 2SK620 SHUTTER DRIVER
IC2 SN74HC244NS BUFFER
IC7 TC7S08F
DRIVER
DRIVER
DRIVER

IC3 CXA1065SW V DRIVER
IC4 CXA1065SW V DRIVER
IC5 CXA1065SW V DRIVER
IC6 CXA1065SW V DRIVER
MODE SELECT

X H1 OUT 1-20 — 1-20 CN
X H2 OUT 1-22 — 1-22 CN
+7V OUT 1-19 — 1-19 CN
ST3 (R) OUT 1-12 — 1-12 CN
ST4 (R) OUT 1-11 — 1-11 CN
IM1 (R) OUT 1-10 — 1-10 CN
IM2 (R) OUT 1-7 — 1-7 CN
IM3 (R) OUT 1-8 — 1-8 CN
IM4 (R) OUT 1-9 — 1-9 CN
ST1 (R) OUT 1-14 — 1-14 CN
ST3 (G) OUT 1-27 — 1-27 CN
ST4 (G) OUT 1-26 — 1-26 CN
IM1 (G) OUT 1-25 — 1-25 CN
IM2 (G) OUT 1-21 — 1-21 CN
IM3 (G) OUT 1-23 — 1-23 CN
IM4 (G) OUT 1-24 — 1-24 CN
ST1 (G) OUT 2-29 — 2-29 CN
-10.0V OUT 1-1 — 1-1 CN
ST3 (B) OUT 1-36 — 1-36 CN
ST4 (B) OUT 1-35 — 1-35 CN
IM1 (B) OUT 1-34 — 1-34 CN
IM2 (B) OUT 1-31 — 1-31 CN
IM3 (B) OUT 1-32 — 1-32 CN
IM4 (B) OUT 1-33 — 1-33 CN
ST1 (B) OUT 1-39 — 1-39 CN
ST2 (B) OUT 1-37 — 1-37 CN
ST2 (G) OUT 1-28 — 1-28 CN
ST2 (R) OUT 1-13 — 1-13 CN
PG OUT 1-2 — 1-2 CN
V SUB (G) OUT 1-30 — 1-30 CN
V SUB (B) OUT 1-40 — 1-40 CN
V SUB (R) OUT 1-15 — 1-15 CN
SHUTT (+) OUT 1-4 — 1-4 CN
SHUTT (-) OUT 1-6 — 1-6 CN

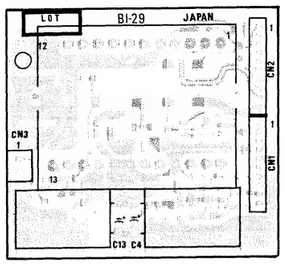
C-7 (B)
C-8 (B)

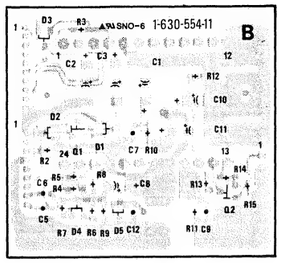
B-RVP701S-CCDBLOCK/M#

CCD BLOCK (2/2) BI-29 BI-30 BI-31
CN-304 PA-91 PA-126

BI-29 BOARD

Ser No.10221-11010 (UC)
30356-31060 (J)
40386-40601 (EK)

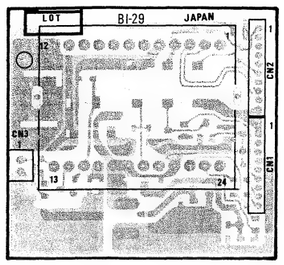


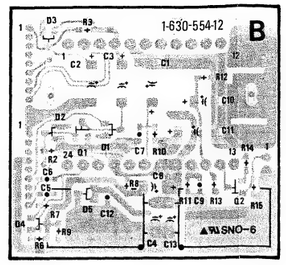


1-630-554-11 SOLDERING SIDE

BI-29 BOARD

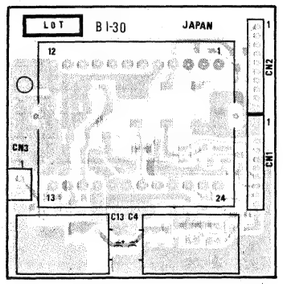
Ser No.11031- (UC)
31061- (J)
41001- (EK)

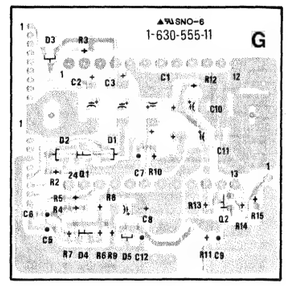




1-630-554-12 SOLDERING SIDE

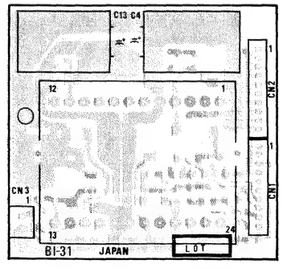
BI-30 BOARD

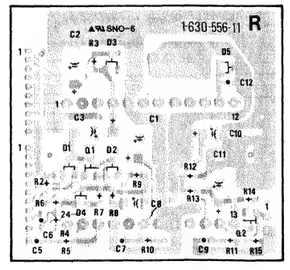




1-630-555-11 SOLDERING SIDE

BI-31 BOARD





1-630-556-11 SOLDERING SIDE

CN-3

PA-9

1-630

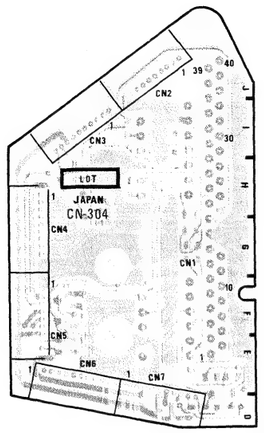
B-BVP70-CCDBLOCK/MOUNT#2

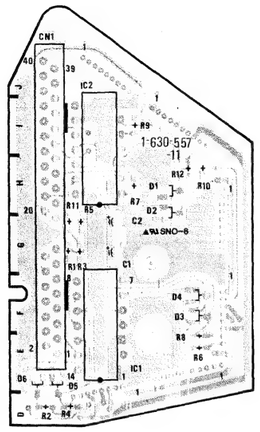
C-9 C-10

A B C D E F G

CCD BLOCK (2/2) BI-29 BI-30 BI-31
CN-304 PA-91 PA-126

CN-304 BOARD



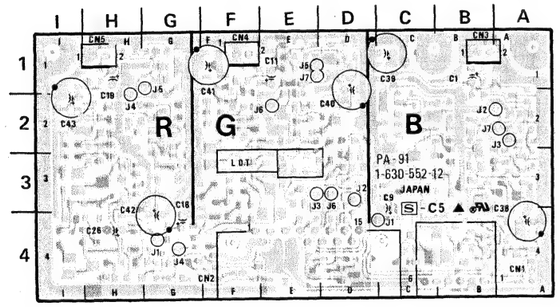


1-630-557-11 SOLDERING SIDE

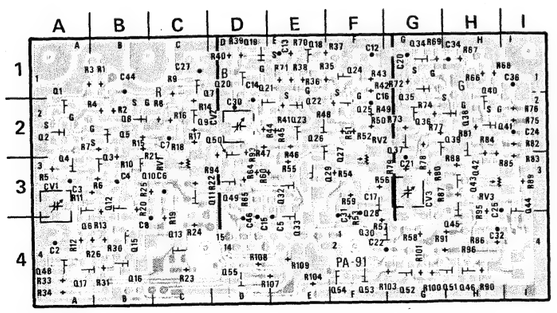
PA-91 BOARD

Ser No.		
10221-	BVP-70 (UC)	
30356-	BVP-70 (J)	
40386-	BVP-70P (EK)	

Ser No.		
11001-11186	BVP-70IS (UC)	
31001-31215	BVP-70IS (J)	
41001-41262	BVP-70ISP (EK)	



1-630-552-12 SOLDERING SIDE



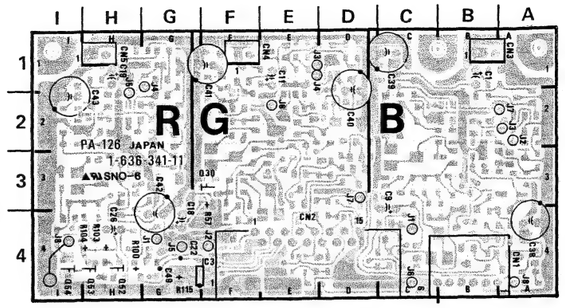
1-630-552-12 SOLDERING SIDE

PA-91 (1-630-552-12)

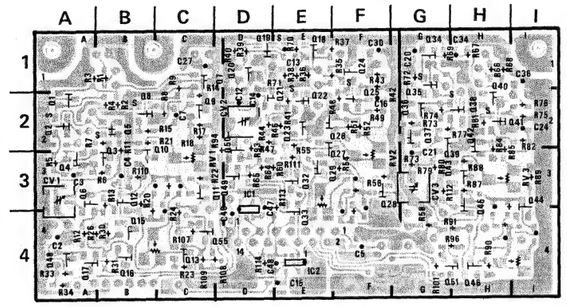
CN1	A - 4	Q40	H - 1
CN2	F - 4	Q41	I - 2
CN3	B - 1	Q42	H - 3
CN4	F - 1	Q43	H - 3
CN5	H - 1	Q44	I - 3
		Q45	H - 4
CV1	A - 3	Q46	H - 4
CV2	D - 2	Q48	A - 4
CV3	G - 3	Q49	D - 3
		Q50	D - 2
Q1	A - 1	Q51	H - 4
Q2	A - 2	Q52	G - 4
Q3	B - 2	Q53	F - 4
Q4	A - 3	Q54	F - 4
Q5	B - 2	Q55	D - 4
Q6	A - 4		
Q7	C - 1	RV1	C - 3
Q8	B - 2	RV2	F - 2
Q9	C - 2	RV3	H - 3
Q10	B - 3		
Q11	D - 3		
Q12	B - 3		
Q13	C - 4		
Q15	B - 4		
Q16	B - 4		
Q17	A - 4		
Q18	E - 1		
Q19	D - 1		
Q20	D - 1		
Q21	D - 1		
Q22	E - 2		
Q23	E - 2		
Q24	F - 1		
Q25	F - 2		
Q26	E - 2		
Q27	F - 3		
Q28	F - 4		
Q29	E - 3		
Q30	F - 4		
Q32	E - 3		
Q33	E - 4		
Q34	G - 1		
Q35	G - 2		
Q36	G - 2		
Q37	G - 2		
Q38	H - 2		
Q39	H - 2		

PA-126 BOARD (For BVP-70IS/70ISP)

Ser No.	
11187-	BVP-70IS (UC)
31216-	BVP-70IS (J)
41263-	BVP-70ISP (EK)



1-636-341-11 SOLDERING SIDE



1-636-341-11 SOLDERING SIDE

PA-126 (1-636-341-11)

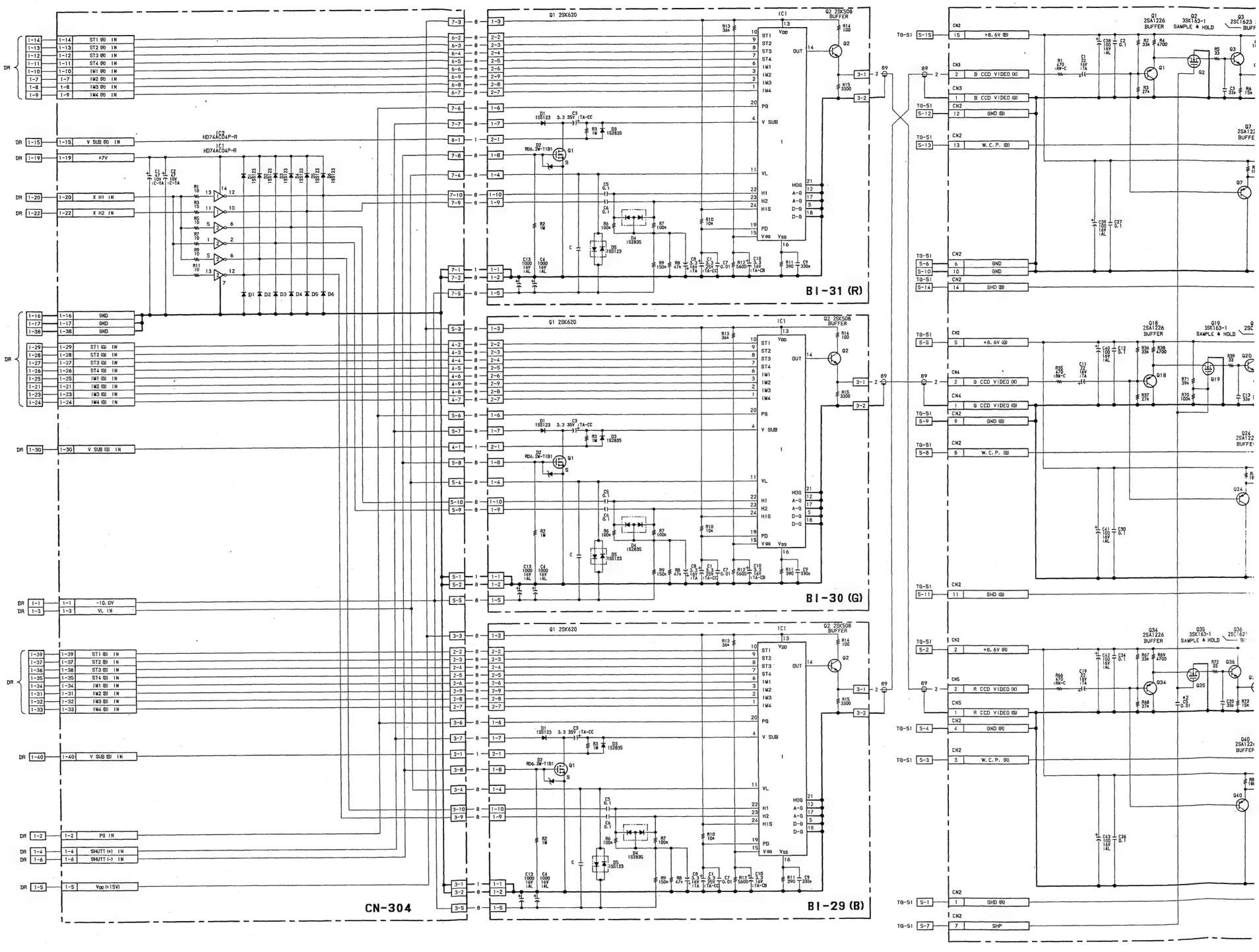
CN1	A - 4
CN2	E - 4
CN3	A - 1
CN4	E - 1
CN5	H - 1
CV1	A - 3
CV2	D - 2
IC1	D - 3
IC2	E - 4
IC3	F - 4
Q1	A - 2
Q2	A - 2
Q3	B - 3
Q4	A - 3
Q5	B - 2
Q6	A - 3
Q7	D - 1
Q8	B - 2
Q9	C - 2
Q10	C - 2
Q11	C - 3
Q12	B - 3
Q13	C - 4
Q15	B - 4
Q16	B - 4
Q17	A - 4
Q18	E - 1
Q19	D - 1
Q20	D - 1
Q21	E - 2
Q22	E - 2
Q23	E - 2
Q24	F - 1
Q25	F - 2
Q26	F - 2
Q27	F - 3
Q28	F - 3
Q29	E - 3
Q30	F - 3
Q32	E - 3
Q33	E - 4
Q34	G - 1
Q35	G - 2
Q36	G - 2
Q37	G - 2
Q38	H - 3
Q39	G - 3
Q40	H - 1
Q41	I - 2
Q42	H - 1
Q43	G - 3
Q44	I - 3
Q45	H - 2
Q46	H - 2
Q48	A - 4
Q49	D - 3
Q50	D - 2
Q51	G - 4
Q52	H - 4
Q53	H - 4
Q54	I - 4
Q55	D - 4
RV1	C - 3
RV2	F - 3
RV3	I - 3

CCD BLOCK (2/2)
BI-29 BI-30 BI-31
CN-304 PA-91

CCD BLOCK (2/2)

BI-29 BOARD
BI-30 BOARD
BI-31 BOARD
CN-304 BOARD
PA-91 BOARD

Ser.No 10221- BVP-70 (UC) 30356- BVP-70 (J) 40386- BVP-70P (EK)	Ser.No 11001-11186 BVP-701S (UC) 31001-31215 BVP-701S (J) 41001-41262 BVP-701SP (EK)



C-13 (A)

C-14 (A)

BVP-70 (J, UC)
BVP-70P (EK)

A | B | C | D | E | F | G

BI-29 BI-30 BI-31 CCD BLOCK (2/2)
CN-304 PA-91

BI-31 (R)

BI-30 (G)

BI-29 (B)

PA-91

C-14 (A)

C-15 (A)

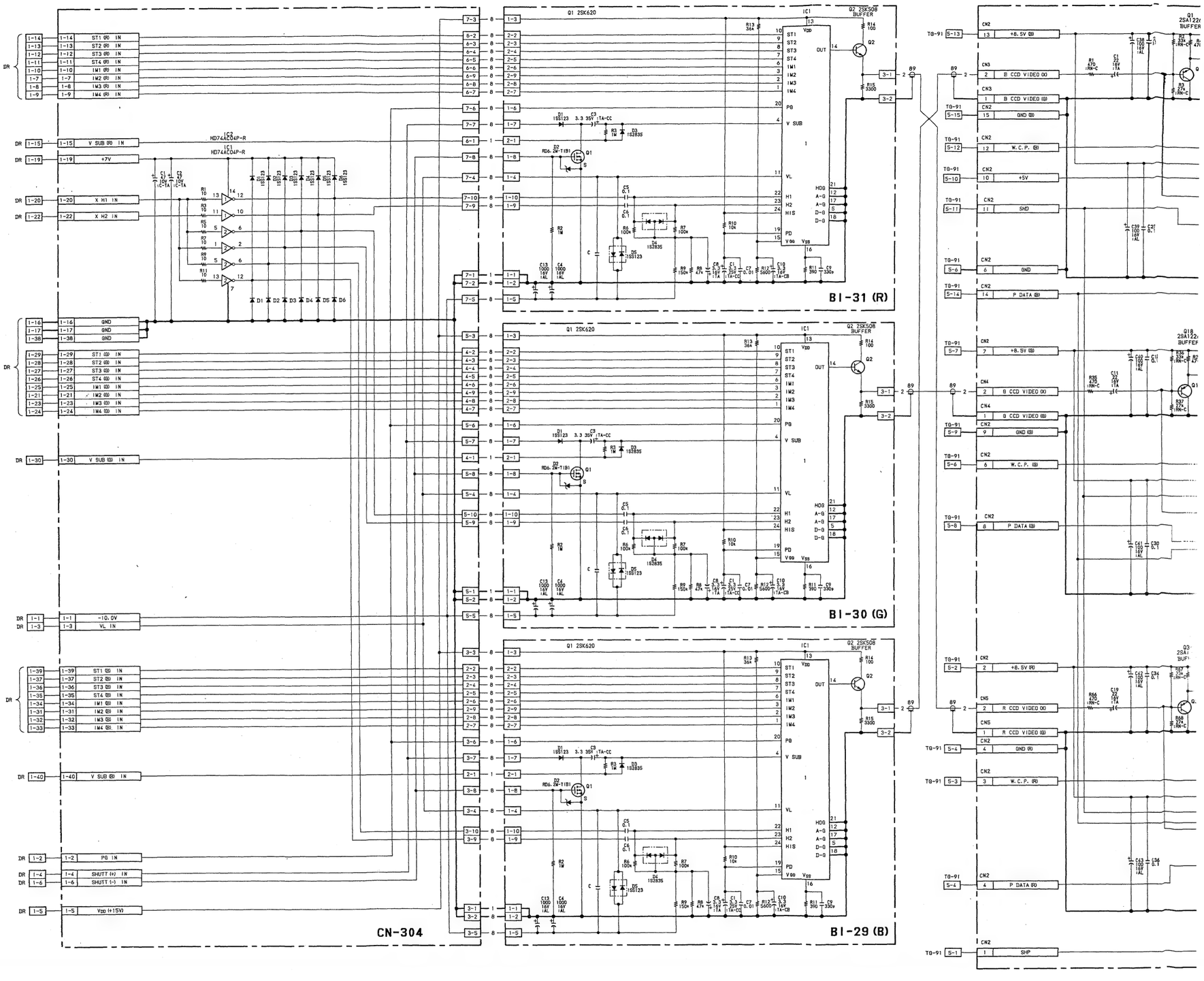
B-BVP70-CCDBLOCK/M#2

CCD BLOCK (2/2)

BI-29 BOARD
BI-30 BOARD
BI-31 BOARD
CN-304 BOARD
PA-126 BOARD

Ser.No 11187- BVP-701S (UC)
31216- BVP-701S (J)
41263- BVP-701SP (EK)

CCD BLOCK (2/2) BI-29 BI-30 BI-31 CN-304 PA-126



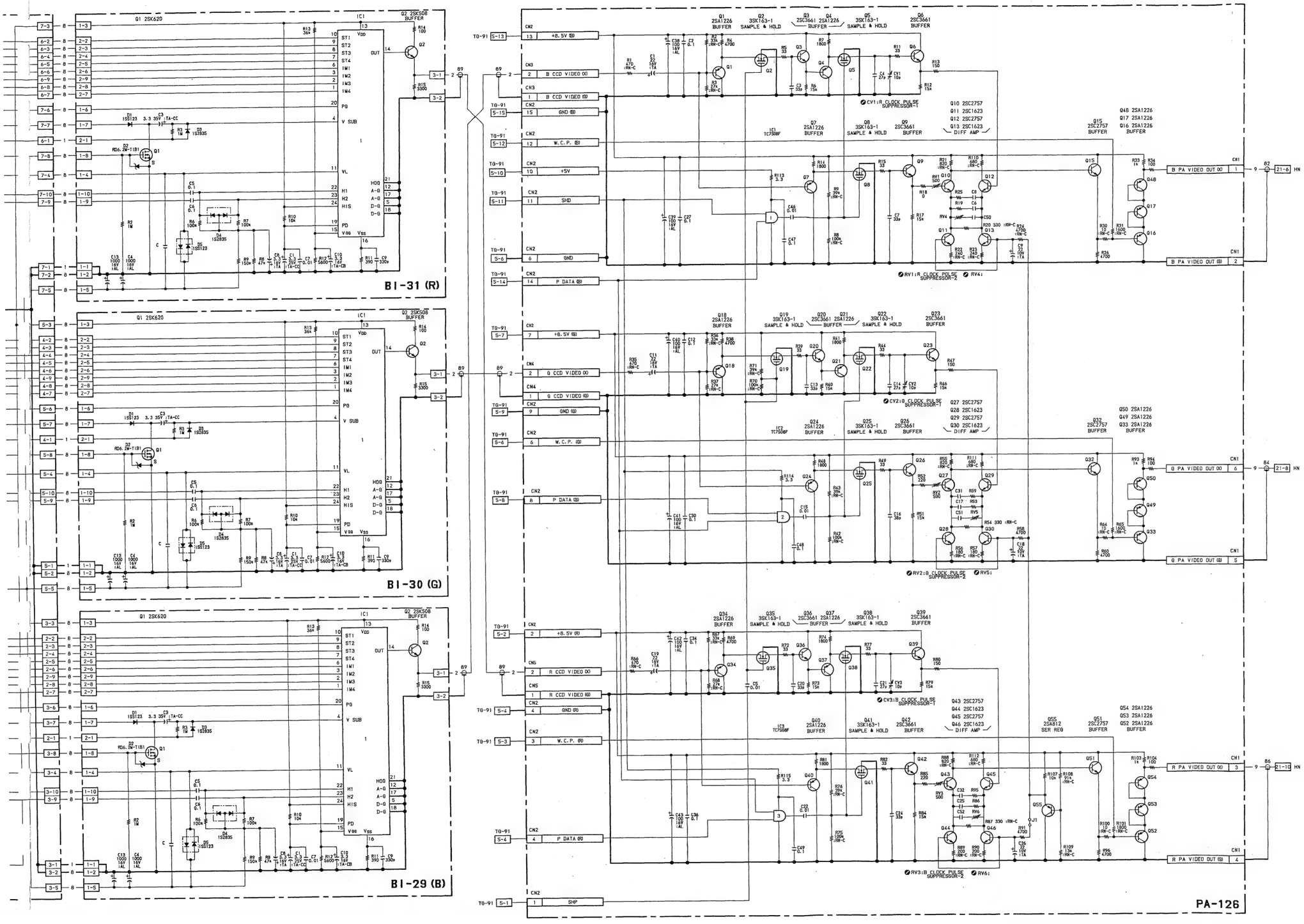
C-13 (B)

C-14 (B)

BVP-701S (J, UC)
BVP-701SP (EK)

A | B | C | D | E | F

BI-29 BI-30 BI-31 CCD BLOCK (2/2)
CN-304 PA-126



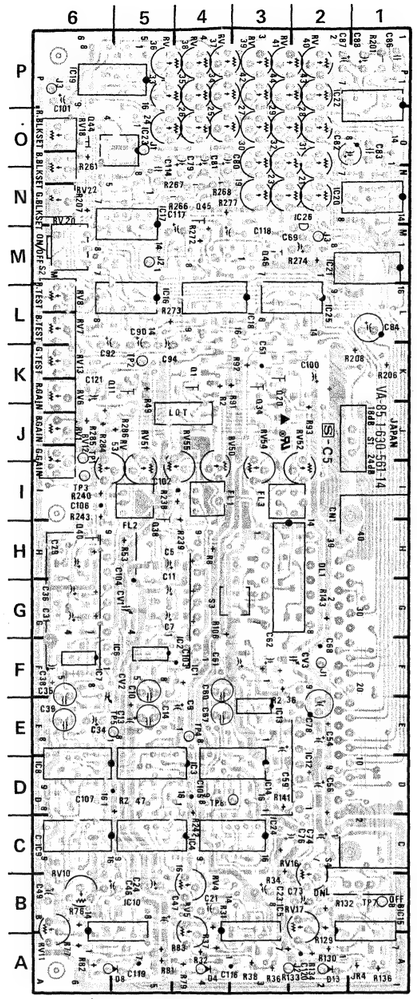
VA-85

VA-85 BOARD

Ser No.10221-11060 (UC)
30356-31100 (J)
40386-41075 (EK)

VA-85 (1-630-561-14)

CN1	I - 2	Q46	M - 3
CV1	G - 5	RV1	J - 6
CV2	F - 5	RV4	B - 4
CV3	F - 2	RV5	B - 4
		RV6	K - 6
D1	I - 5	RV7	L - 6
D3	A - 3	RV8	L - 6
D4	A - 4	RV10	B - 6
D5	I - 6	RV11	A - 6
D7	A - 5	RV12	J - 6
D8	A - 5	RV13	K - 6
D10	G - 2	RV16	C - 2
D12	A - 1	RV17	B - 2
D13	A - 2	RV18	O - 6
D14	L - 2	RV19	N - 3
D16	N - 5	RV20	N - 6
		RV21	N - 2
DL1	H - 2	RV22	N - 6
		RV23	N - 3
FL1	I - 3	RV24	O - 5
FL2	H - 5	RV25	O - 4
FL3	I - 3	RV26	O - 4
		RV27	O - 3
IC1	F - 4	RV28	O - 2
IC2	F - 4	RV29	O - 3
IC3	D - 4	RV30	O - 3
IC4	C - 4	RV31	O - 2
IC5	B - 3	RV32	O - 3
IC6	F - 5	RV33	P - 5
IC7	F - 6	RV34	P - 4
IC8	D - 6	RV35	P - 4
IC9	C - 6	RV36	P - 5
IC10	B - 5	RV37	P - 4
IC12	D - 2	RV38	P - 4
IC13	E - 3	RV39	P - 3
IC14	D - 3	RV40	P - 2
IC15	B - 1	RV41	P - 3
IC16	L - 5	RV42	P - 3
IC17	N - 5	RV43	P - 2
IC18	L - 3	RV44	P - 3
IC19	P - 6	RV50	J - 3
IC20	N - 2	RV51	J - 5
IC21	M - 2	RV52	J - 2
IC23	O - 5	RV53	J - 5
IC24	C - 3	RV54	J - 3
IC25	L - 2	RV55	J - 4
IC26	N - 2		
		S1	J - 1
Q1	K - 4	S2	M - 6
Q2	K - 3	S3	G - 4
Q3	K - 4	S4	C - 2
Q4	H - 4		
Q5	G - 4	TP1	J - 6
Q7	A - 4	TP2	K - 5
Q8	A - 4	TP3	I - 6
Q9	A - 3	TP4	E - 4
Q10	L - 3	TP5	E - 5
Q11	K - 5	TP6	D - 4
Q12	K - 5	TP7	B - 1
Q13	K - 6		
Q14	H - 6		
Q15	G - 6		
Q17	B - 5		
Q18	A - 5		
Q19	A - 5		
Q20	K - 3		
Q21	K - 2		
Q22	K - 3		
Q23	K - 3		
Q24	H - 3		
Q25	F - 3		
Q27	B - 1		
Q28	A - 1		
Q29	A - 1		
Q30	M - 4		
Q31	M - 5		
Q32	M - 3		
Q33	M - 1		
Q34	J - 3		
Q38	H - 5		
Q39	H - 5		
Q40	H - 6		
Q41	H - 6		
Q42	J - 3		
Q43	J - 3		
Q44	O - 6		
Q45	N - 4		



1-630-561-14 SOLDERING SIDE

C-16(a)

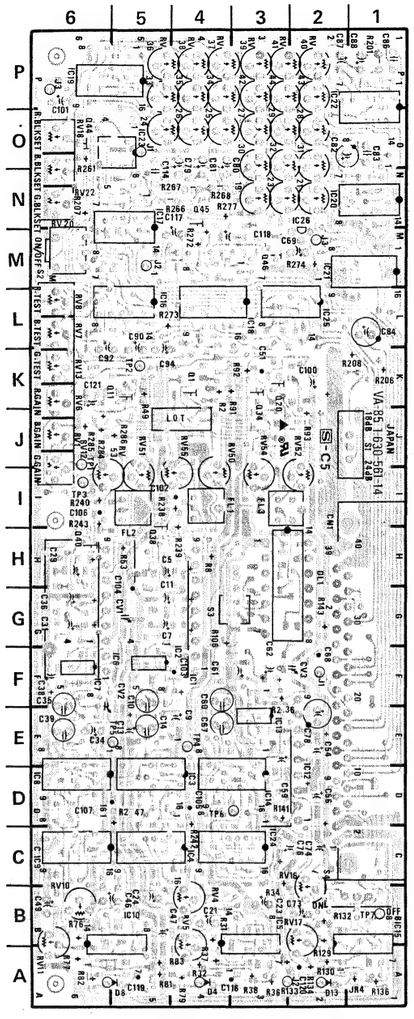
C-17(a)

\- 5 BOARD

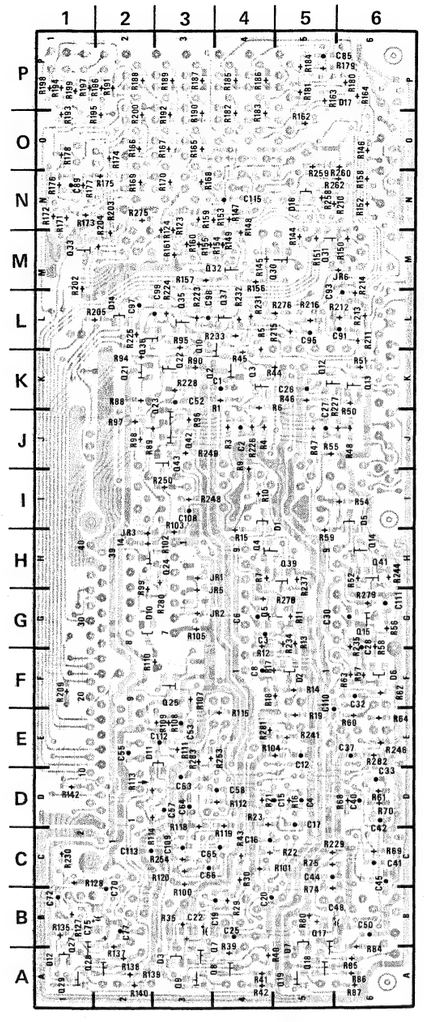
Ser No.10221-11060 (UC)
30356-31100 (J)
40386-41075 (EK)

VA (1-630-561-14)

CN.	I - 2	Q46	M - 3
CV1	G - 5	RV1	J - 6
CV	F - 5	RV4	B - 4
CV	F - 2	RV5	B - 4
		RV6	K - 6
D1	I - 5	RV7	L - 6
D3	A - 3	RV8	L - 6
D4	A - 4	RV10	B - 6
D5	I - 6	RV11	A - 6
D7	A - 5	RV12	J - 6
D8	A - 5	RV13	K - 6
D1	G - 2	RV16	C - 2
D12	A - 1	RV17	B - 2
D13	A - 2	RV18	O - 6
D1	L - 2	RV19	N - 3
D1	N - 5	RV20	N - 6
		RV21	N - 2
DL.	H - 2	RV22	N - 6
		RV23	N - 3
FL1	I - 3	RV24	O - 5
FL2	H - 5	RV25	O - 4
FL	I - 3	RV26	O - 4
		RV27	O - 3
IC1	F - 4	RV28	O - 2
IC2	F - 4	RV29	O - 3
IC3	D - 4	RV30	O - 3
IC	C - 4	RV31	O - 2
IC	B - 3	RV32	O - 3
IC	F - 5	RV33	P - 5
IC	F - 6	RV34	P - 4
IC8	D - 6	RV35	P - 4
IC9	C - 6	RV36	P - 5
IC	B - 5	RV37	P - 4
IC	D - 2	RV38	P - 4
IC	E - 3	RV39	P - 3
IC.	D - 3	RV40	P - 2
IC15	B - 1	RV41	P - 3
IC16	L - 5	RV42	P - 3
IC	N - 5	RV43	P - 2
IC	L - 3	RV44	P - 3
IC	P - 6	RV50	J - 3
IC	N - 2	RV51	J - 5
IC21	M - 2	RV52	J - 2
IC23	O - 5	RV53	J - 5
IC	C - 3	RV54	J - 3
IC	L - 2	RV55	J - 4
IC	N - 2		
		S1	J - 1
Q1	K - 4	S2	M - 6
Q2	K - 3	S3	G - 4
Q	K - 4	S4	C - 2
Q	H - 4		
Q	G - 4	TP1	J - 6
Q	A - 4	TP2	K - 5
Q8	A - 4	TP3	I - 6
Q9	A - 3	TP4	E - 4
Q	L - 3	TP5	E - 5
Q	K - 5	TP6	D - 4
Q	K - 5	TP7	B - 1
Q	K - 6		
Q14	H - 6		
Q15	G - 6		
Q	B - 5		
Q	A - 5		
Q	A - 5		
Q	K - 3		
Q21	K - 2		
Q22	K - 3		
Q	K - 3		
Q	H - 3		
Q	F - 3		
Q	B - 1		
Q28	A - 1		
Q29	A - 1		
	M - 4		
	M - 5		
	M - 3		
	M - 1		
Q34	J - 3		
Q38	H - 5		
	H - 5		
	H - 6		
	H - 6		
	J - 3		
Q43	J - 3		
Q44	O - 6		
	N - 4		



1-630-561-14 SOLDERING SIDE



1-630-561-14 SOLDERING SIDE

VA-85 (1-630-561-14)

CN1	I - 2	Q46	M - 3
CV1	G - 5	RV1	J - 6
CV2	F - 5	RV4	B - 4
CV3	F - 2	RV5	B - 4
		RV6	K - 6
D1	I - 5	RV7	L - 6
D3	A - 3	RV8	L - 6
D4	A - 4	RV10	B - 6
D5	I - 6	RV11	A - 6
D7	A - 5	RV12	J - 6
D8	A - 5	RV13	K - 6
D10	G - 2	RV16	C - 2
D12	A - 1	RV17	B - 2
D13	A - 2	RV18	O - 6
D14	L - 2	RV19	N - 3
D16	N - 5	RV20	N - 6
		RV21	N - 2
DL1	H - 2	RV22	N - 6
		RV23	N - 3
FL1	I - 3	RV24	O - 5
FL2	H - 5	RV25	O - 4
FL3	I - 3	RV26	O - 4
		RV27	O - 3
IC1	F - 4	RV28	O - 2
IC2	F - 4	RV29	O - 3
IC3	D - 4	RV30	O - 3
IC4	C - 4	RV31	O - 2
IC5	B - 3	RV32	O - 3
IC6	F - 5	RV33	P - 5
IC7	F - 6	RV34	P - 4
IC8	D - 6	RV35	P - 4
IC9	C - 6	RV36	P - 5
IC10	B - 5	RV37	P - 4
IC12	D - 2	RV38	P - 4
IC13	E - 3	RV39	P - 3
IC14	D - 3	RV40	P - 2
IC15	B - 1	RV41	P - 3
IC16	L - 5	RV42	P - 3
IC17	N - 5	RV43	P - 2
IC18	L - 3	RV44	P - 3
IC19	P - 6	RV50	J - 3
IC20	N - 2	RV51	J - 5
IC21	M - 2	RV52	J - 2
IC23	O - 5	RV53	J - 5
IC24	C - 3	RV54	J - 3
IC25	L - 2	RV55	J - 4
IC26	N - 2		
		S1	J - 1
Q1	K - 4	S2	M - 6
Q2	K - 3	S3	G - 4
Q3	K - 4	S4	C - 2
Q4	H - 4		
Q5	G - 4	TP1	J - 6
Q7	A - 4	TP2	K - 5
Q8	A - 4	TP3	I - 6
Q9	A - 3	TP4	E - 4
Q10	L - 3	TP5	E - 5
Q11	K - 5	TP6	D - 4
Q12	K - 5	TP7	B - 1
Q13	K - 6		
Q14	H - 6		
Q15	G - 6		
Q17	B - 5		
Q18	A - 5		
Q19	A - 5		
Q20	K - 3		
Q21	K - 2		
Q22	K - 3		
Q23	K - 3		
Q24	H - 3		
Q25	F - 3		
Q27	B - 1		
Q28	A - 1		
Q29	A - 1		
Q30	M - 4		
Q31	M - 5		
Q32	M - 3		
Q33	M - 1		
Q34	J - 3		
Q38	H - 5		
Q39	H - 5		
Q40	H - 6		
Q41	H - 6		
Q42	J - 3		
Q43	J - 3		
Q44	O - 6		
Q45	N - 4		

C-17(a)

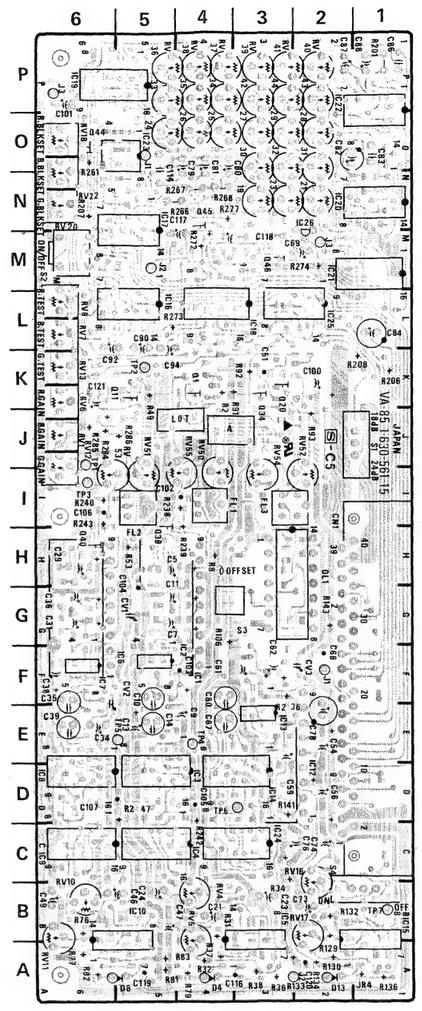
C-18(a)

VA-85 BOARD

Ser No.11061-11186 (UC)
31101-31215 (J)
41076-41262 (EK)

VA-85 (1-630-561-15)

CN1	I - 2
CV1	G - 5
CV2	F - 5
CV3	F - 2
D1	I - 5
D3	A - 3
D4	A - 4
D5	I - 6
D7	A - 5
D8	A - 5
D10	G - 2
D12	A - 1
D13	A - 2
D14	L - 2
D16	N - 5
DL1	H - 2
FL1	I - 3
FL2	H - 5
FL3	I - 3
IC1	F - 4
IC2	F - 4
IC3	D - 4
IC4	C - 4
IC5	B - 3
IC6	F - 5
IC7	F - 6
IC8	D - 6
IC9	C - 6
IC10	B - 5
IC12	D - 2
IC13	E - 3
IC14	D - 3
IC15	B - 1
IC16	L - 5
IC17	N - 5
IC18	L - 3
IC19	P - 6
IC20	N - 2
IC21	M - 2
IC22	P - 2
IC23	O - 5
IC24	C - 3
IC25	L - 2
IC26	N - 2
JR3	H - 2
JR4	A - 1
JR6	M - 6
Q1	K - 4
Q2	K - 3
Q3	K - 4
Q4	H - 4
Q5	G - 4
Q7	A - 4
Q8	A - 4
Q9	A - 3
Q10	L - 3
Q11	K - 5
Q12	K - 5
Q13	K - 6
Q14	H - 6
Q15	G - 6
Q17	B - 5
Q18	A - 5
Q19	A - 5
Q20	K - 3
Q21	K - 2
Q22	K - 3
Q23	K - 3
Q24	H - 3
Q25	F - 3
Q27	B - 1
Q28	A - 1
Q29	A - 1
Q30	M - 4
Q31	M - 5
Q32	M - 3
Q33	M - 1
Q34	J - 3
Q38	H - 5
Q39	H - 5
Q40	H - 6
Q41	H - 6
Q42	J - 3
Q43	J - 3
Q44	O - 6
Q45	N - 4
Q46	M - 3
RV1	J - 6
RV4	B - 4
RV5	B - 4
RV6	K - 6
RV7	L - 6
RV8	L - 6
RV10	B - 6
RV11	A - 6
RV12	J - 6
RV13	K - 6
RV16	C - 2
RV17	B - 2
RV18	O - 6
RV19	N - 3
RV20	N - 6
RV21	N - 2
RV22	N - 6
RV23	N - 3
RV24	O - 5
RV25	O - 4
RV26	O - 4
RV27	O - 3
RV28	O - 2
RV29	O - 3
RV30	O - 3
RV31	O - 2
RV32	O - 3
RV33	P - 5
RV34	P - 4
RV35	P - 4
RV36	P - 5
RV37	P - 4
RV38	P - 4
RV39	P - 3
RV40	P - 2
RV41	P - 3
RV42	P - 3
RV43	P - 2
RV44	P - 3
RV50	J - 3
RV51	J - 5
RV52	J - 2
RV53	J - 5
RV54	J - 3
RV55	J - 4
S1	J - 1
S2	M - 6
S3	G - 3
S4	C - 2
TP1	J - 6
TP2	K - 5
TP3	I - 6
TP4	E - 4
TP5	E - 5
TP6	D - 4
TP7	B - 1



1-630-561-15 SOLDERING SIDE

B-BVP70-VA85/MOUNT

C-16 (b)

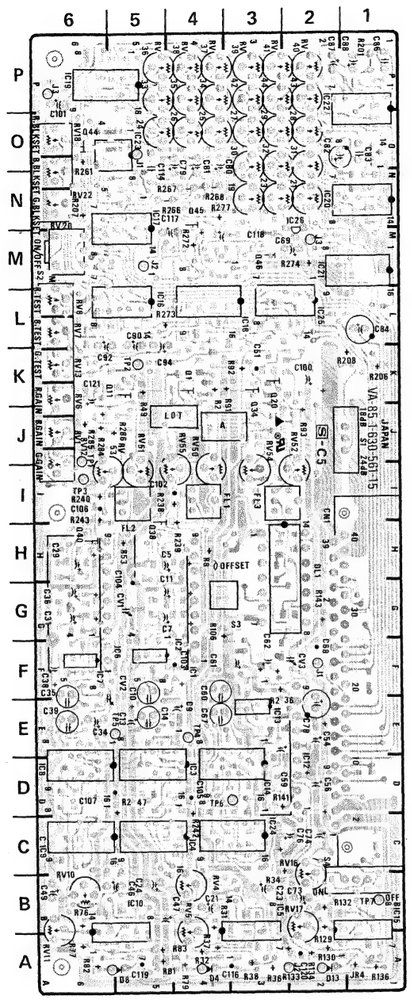
C-17 (b)

VA-85 BOARD

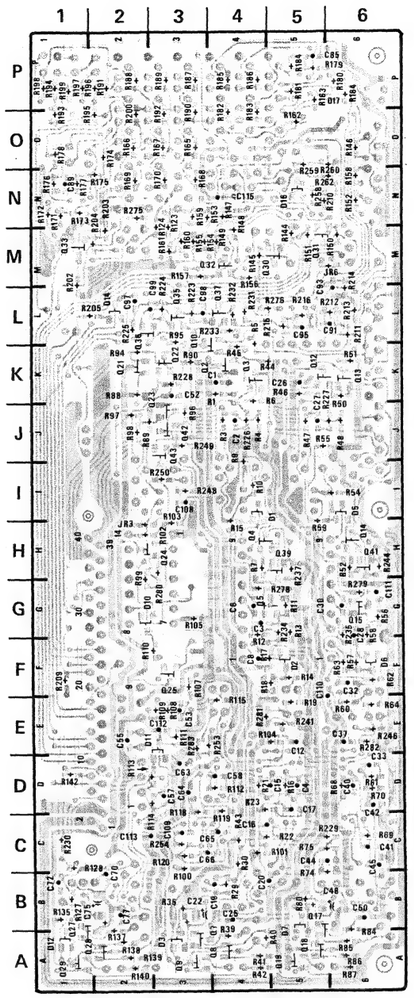
Ser No.11061-11186 (UC)
31101-31215 (J)
41076-41262 (EK)

VA-85 (1-630-561-15)

CN1	I - 2	Q41	H - 6		
		Q42	J - 3		
CV1	G - 5	Q43	J - 3		
CV2	F - 5	Q44	O - 6		
CV3	F - 2	Q45	N - 4		
		Q46	M - 3		
D1	I - 5				
D3	A - 3	RV1	J - 6		
D4	A - 4	RV4	B - 4		
D5	I - 6	RV5	B - 4		
D7	A - 5	RV6	K - 6		
D8	A - 5	RV7	L - 6		
D10	G - 2	RV8	L - 6		
D12	A - 1	RV10	B - 6		
D13	A - 2	RV11	A - 6		
D14	L - 2	RV12	J - 6		
D16	N - 5	RV13	K - 6		
		RV16	C - 2		
DL1	H - 2	RV17	B - 2		
		RV18	O - 6		
FL1	I - 3	RV19	N - 3		
FL2	H - 5	RV20	N - 6		
FL3	I - 3	RV21	N - 2		
		RV22	N - 6		
IC1	F - 4	RV23	N - 3		
IC2	F - 4	RV24	O - 5		
IC3	D - 4	RV25	O - 4		
IC4	C - 4	RV26	O - 4		
IC5	B - 3	RV27	O - 3		
IC6	F - 5	RV28	O - 2		
IC7	F - 6	RV29	O - 3		
IC8	D - 6	RV30	O - 3		
IC9	C - 6	RV31	O - 2		
IC10	B - 5	RV32	O - 3		
IC12	D - 2	RV33	P - 5		
IC13	E - 3	RV34	P - 4		
IC14	D - 3	RV35	P - 4		
IC15	B - 1	RV36	P - 5		
IC16	L - 5	RV37	P - 4		
IC17	N - 5	RV38	P - 4		
IC18	L - 3	RV39	P - 3		
IC19	P - 6	RV40	P - 2		
IC20	N - 2	RV41	P - 3		
IC21	M - 2	RV42	P - 3		
IC22	P - 2	RV43	P - 2		
IC23	O - 5	RV44	P - 3		
IC24	C - 3	RV50	J - 3		
IC25	L - 2	RV51	J - 5		
IC26	N - 2	RV52	J - 2		
		RV53	J - 5		
JR3	H - 2	RV54	J - 3		
JR4	A - 1	RV55	J - 4		
JR6	M - 6				
		S1	J - 1		
Q1	K - 4	S2	M - 6		
Q2	K - 3	S3	G - 3		
Q3	K - 4	S4	C - 2		
Q4	H - 4				
Q5	G - 4	TP1	J - 6		
Q7	A - 4	TP2	K - 5		
Q8	A - 4	TP3	I - 6		
Q9	A - 3	TP4	E - 4		
Q10	L - 3	TP5	E - 5		
Q11	K - 5	TP6	D - 4		
Q12	K - 5	TP7	B - 1		
Q13	K - 6				
Q14	H - 6				
Q15	G - 6				
Q17	B - 5				
Q18	A - 5				
Q19	A - 5				
Q20	K - 3				
Q21	K - 2				
Q22	K - 3				
Q23	K - 3				
Q24	H - 3				
Q25	F - 3				
Q27	B - 1				
Q28	A - 1				
Q29	A - 1				
Q30	M - 4				
Q31	M - 5				
Q32	M - 3				
Q33	M - 1				
Q34	J - 3				
Q38	H - 5				
Q39	H - 5				
Q40	H - 6				



1-630-561-15 SOLDERING SIDE



1-630-561-15 SOLDERING SIDE

VA-85 (1-630-561-15)

CN1	I - 2	Q41	H - 6		
		Q42	J - 3		
CV1	G - 5	Q43	J - 3		
CV2	F - 5	Q44	O - 6		
CV3	F - 2	Q45	N - 4		
		Q46	M - 3		
D1	I - 5				
D3	A - 3	RV1	J - 6		
D4	A - 4	RV4	B - 4		
D5	I - 6	RV5	B - 4		
D7	A - 5	RV6	K - 6		
D8	A - 5	RV7	L - 6		
D10	G - 2	RV8	L - 6		
D12	A - 1	RV10	B - 6		
D13	A - 2	RV11	A - 6		
D14	L - 2	RV12	J - 6		
D16	N - 5	RV13	K - 6		
		RV16	C - 2		
DL1	H - 2	RV17	B - 2		
		RV18	O - 6		
FL1	I - 3	RV19	N - 3		
FL2	H - 5	RV20	N - 6		
FL3	I - 3	RV21	N - 2		
		RV22	N - 6		
IC1	F - 4	RV23	N - 3		
IC2	F - 4	RV24	O - 5		
IC3	D - 4	RV25	O - 4		
IC4	C - 4	RV26	O - 4		
IC5	B - 3	RV27	O - 3		
IC6	F - 5	RV28	O - 2		
IC7	F - 6	RV29	O - 3		
IC8	D - 6	RV30	O - 3		
IC9	C - 6	RV31	O - 2		
IC10	B - 5	RV32	O - 3		
IC12	D - 2	RV33	P - 5		
IC13	E - 3	RV34	P - 4		
IC14	D - 3	RV35	P - 4		
IC15	B - 1	RV36	P - 5		
IC16	L - 5	RV37	P - 4		
IC17	N - 5	RV38	P - 4		
IC18	L - 3	RV39	P - 3		
IC19	P - 6	RV40	P - 2		
IC20	N - 2	RV41	P - 3		
IC21	M - 2	RV42	P - 3		
IC22	P - 2	RV43	P - 2		
IC23	O - 5	RV44	P - 3		
IC24	C - 3	RV50	J - 3		
IC25	L - 2	RV51	J - 5		
IC26	N - 2	RV52	J - 2		
		RV53	J - 5		
JR3	H - 2	RV54	J - 3		
JR4	A - 1	RV55	J - 4		
JR6	M - 6				
		S1	J - 1		
Q1	K - 4	S2	M - 6		
Q2	K - 3	S3	G - 3		
Q3	K - 4	S4	C - 2		
Q4	H - 4				
Q5	G - 4	TP1	J - 6		
Q7	A - 4	TP2	K - 5		
Q8	A - 4	TP3	I - 6		
Q9	A - 3	TP4	E - 4		
Q10	L - 3	TP5	E - 5		
Q11	K - 5	TP6	D - 4		
Q12	K - 5	TP7	B - 1		
Q13	K - 6				
Q14	H - 6				
Q15	G - 6				
Q17	B - 5				
Q18	A - 5				
Q19	A - 5				
Q20	K - 3				
Q21	K - 2				
Q22	K - 3				
Q23	K - 3				
Q24	H - 3				
Q25	F - 3				
Q27	B - 1				
Q28	A - 1				
Q29	A - 1				
Q30	M - 4				
Q31	M - 5				
Q32	M - 3				
Q33	M - 1				
Q34	J - 3				
Q38	H - 5				
Q39	H - 5				
Q40	H - 6				

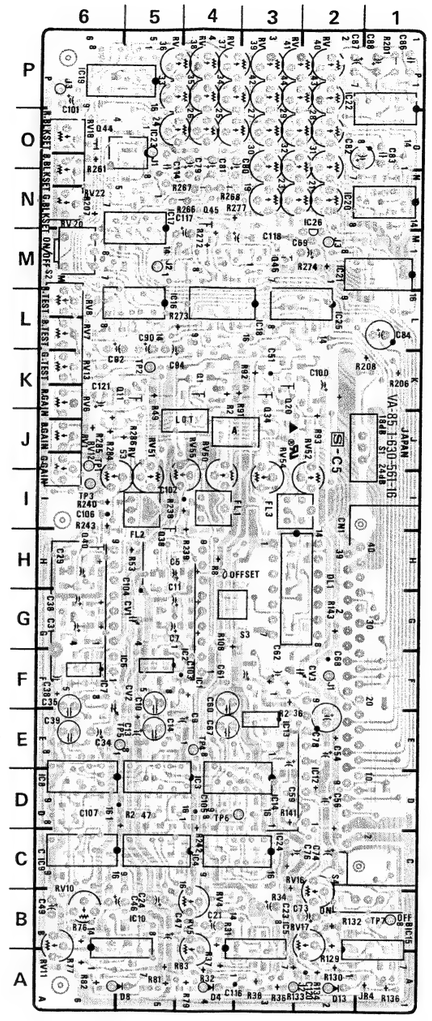
VA-85 VA-85

VA-85 BOARD

Ser No.11187- (UC)
31216- (J)
41263- (EK)

VA-85 (1-630-561-16)

CN1	I - 2	Q41	H - 6		
		Q42	J - 3		
CV1	G - 5	Q43	J - 3		
CV2	F - 5	Q44	O - 6		
CV3	F - 2	Q45	N - 4		
		Q46	M - 3		
D1	I - 5				
D3	A - 3	RV1	J - 6		
D4	A - 4	RV4	B - 4		
D5	I - 6	RV5	B - 4		
D7	A - 5	RV6	K - 6		
D8	A - 5	RV7	L - 6		
D10	G - 2	RV8	L - 6		
D12	A - 1	RV10	B - 6		
D13	A - 2	RV11	A - 6		
D14	L - 2	RV12	J - 6		
D16	N - 5	RV13	K - 6		
		RV16	C - 2		
DL1	H - 2	RV17	B - 2		
		RV18	O - 6		
FL1	I - 3	RV19	N - 3		
FL2	H - 5	RV20	N - 6		
FL3	I - 3	RV21	N - 2		
		RV22	N - 6		
IC1	F - 4	RV23	N - 3		
IC2	F - 4	RV24	O - 5		
IC3	D - 4	RV25	O - 4		
IC4	C - 4	RV26	O - 4		
IC5	B - 3	RV27	O - 3		
IC6	F - 5	RV28	O - 2		
IC7	F - 6	RV29	O - 3		
IC8	D - 6	RV30	O - 3		
IC9	C - 6	RV31	O - 2		
IC10	B - 5	RV32	O - 3		
IC12	D - 2	RV33	P - 5		
IC13	E - 3	RV34	P - 4		
IC14	D - 3	RV35	P - 4		
IC15	B - 1	RV36	P - 5		
IC16	L - 5	RV37	P - 4		
IC17	N - 5	RV38	P - 4		
IC18	L - 3	RV39	P - 3		
IC19	P - 6	RV40	P - 2		
IC20	N - 2	RV41	P - 3		
IC21	M - 2	RV42	P - 3		
IC22	P - 2	RV43	P - 2		
IC23	O - 5	RV44	P - 3		
IC24	C - 3	RV50	J - 3		
IC25	L - 2	RV51	J - 5		
IC26	N - 2	RV52	J - 2		
		RV53	J - 5		
JR3	H - 2	RV54	J - 3		
JR4	A - 1	RV55	J - 4		
JR6	M - 6				
		S1	J - 1		
Q1	K - 4	S2	M - 6		
Q2	K - 3	S3	G - 3		
Q3	K - 4	S4	C - 2		
Q4	H - 4				
Q5	G - 4	TP1	J - 6		
Q7	A - 4	TP2	K - 5		
Q8	A - 4	TP3	I - 6		
Q9	A - 3	TP4	E - 4		
Q10	L - 3	TP5	E - 5		
Q11	K - 5	TP6	D - 4		
Q12	K - 5	TP7	B - 1		
Q13	K - 6				
Q14	H - 6				
Q15	G - 6				
Q17	B - 5				
Q18	A - 5				
Q19	A - 5				
Q20	K - 3				
Q21	K - 2				
Q22	K - 3				
Q23	K - 3				
Q24	H - 3				
Q25	F - 3				
Q27	B - 1				
Q28	A - 1				
Q29	A - 1				
Q30	M - 4				
Q31	M - 5				
Q32	M - 3				
Q33	M - 1				
Q34	J - 3				
Q38	H - 5				
Q39	H - 5				
Q40	H - 6				



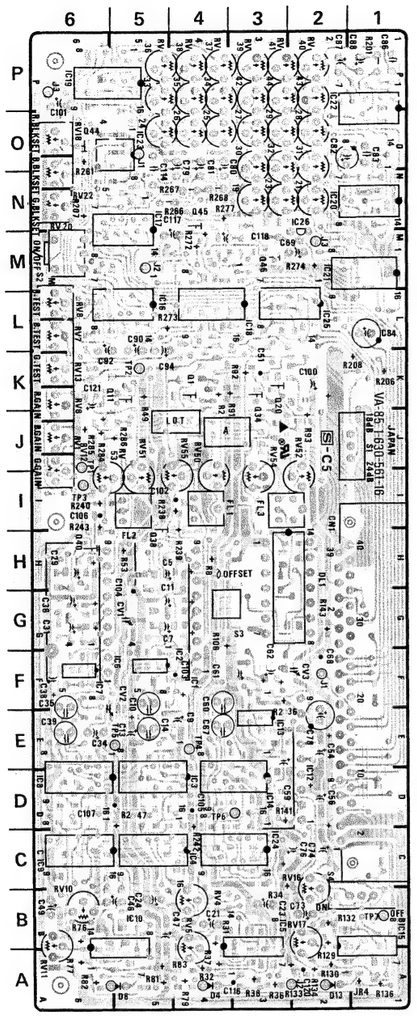
1-630-561-16 SOLDERING SIDE

VA-85 BOARD

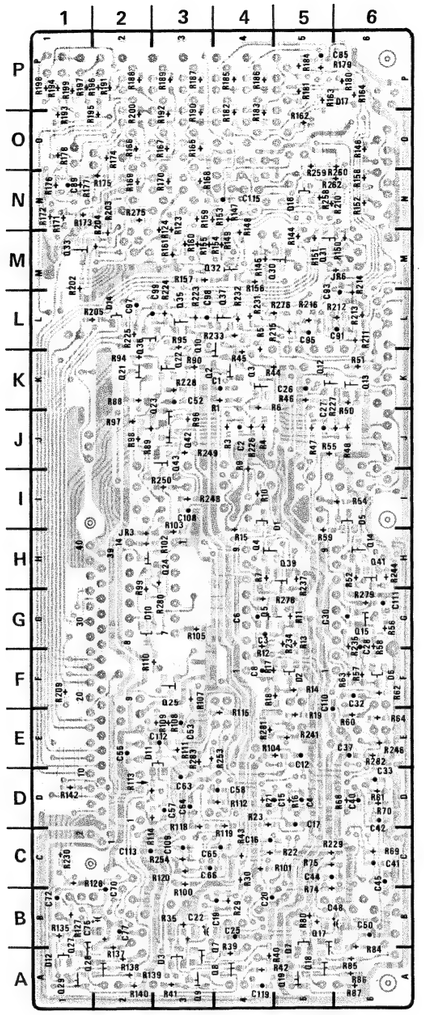
Ser No.11187- (UC)
31216- (J)
41263- (EK)

VA-85 (1-630-561-16)

CN1	I - 2	Q41	H - 6
		Q42	J - 3
CV1	G - 5	Q43	J - 3
CV2	F - 5	Q44	O - 6
CV3	F - 2	Q45	N - 4
		Q46	M - 3
D1	I - 5		
D3	A - 3	RV1	J - 6
D4	A - 4	RV4	B - 4
D5	I - 6	RV5	B - 4
D7	A - 5	RV6	K - 6
D8	A - 5	RV7	L - 6
D10	G - 2	RV8	L - 6
D12	A - 1	RV10	B - 6
D13	A - 2	RV11	A - 6
D14	L - 2	RV12	J - 6
D16	N - 5	RV13	K - 6
		RV16	C - 2
DL1	H - 2	RV17	B - 2
		RV18	O - 6
FL1	I - 3	RV19	N - 3
FL2	H - 5	RV20	N - 6
FL3	I - 3	RV21	N - 2
		RV22	N - 6
IC1	F - 4	RV23	N - 3
IC2	F - 4	RV24	O - 5
IC3	D - 4	RV25	O - 4
IC4	C - 4	RV26	O - 4
IC5	B - 3	RV27	O - 3
IC6	F - 5	RV28	O - 2
IC7	F - 6	RV29	O - 3
IC8	D - 6	RV30	O - 3
IC9	C - 6	RV31	O - 2
IC10	B - 5	RV32	O - 3
IC12	D - 2	RV33	P - 5
IC13	E - 3	RV34	P - 4
IC14	D - 3	RV35	P - 4
IC15	B - 1	RV36	P - 5
IC16	L - 5	RV37	P - 4
IC17	N - 5	RV38	P - 4
IC18	L - 3	RV39	P - 3
IC19	P - 6	RV40	P - 2
IC20	N - 2	RV41	P - 3
IC21	M - 2	RV42	P - 3
IC22	P - 2	RV43	P - 2
IC23	O - 5	RV44	P - 3
IC24	C - 3	RV50	J - 3
IC25	L - 2	RV51	J - 5
IC26	N - 2	RV52	J - 2
		RV53	J - 5
JR3	H - 2	RV54	J - 3
JR4	A - 1	RV55	J - 4
JR6	M - 6		
		S1	J - 1
Q1	K - 4	S2	M - 6
Q2	K - 3	S3	G - 3
Q3	K - 4	S4	C - 2
Q4	H - 4		
Q5	G - 4	TP1	J - 6
Q7	A - 4	TP2	K - 5
Q8	A - 4	TP3	I - 6
Q9	A - 3	TP4	E - 4
Q10	L - 3	TP5	E - 5
Q11	K - 5	TP6	D - 4
Q12	K - 5	TP7	B - 1
Q13	K - 6		
Q14	H - 6		
Q15	G - 6		
Q17	B - 5		
Q18	A - 5		
Q19	A - 5		
Q20	K - 3		
Q21	K - 2		
Q22	K - 3		
Q23	K - 3		
Q24	H - 3		
Q25	F - 3		
Q27	B - 1		
Q28	A - 1		
Q29	A - 1		
Q30	M - 4		
Q31	M - 5		
Q32	M - 3		
Q33	M - 1		
Q34	J - 3		
Q38	H - 5		
Q39	H - 5		
Q40	H - 6		



1-630-561-16 SOLDERING SIDE



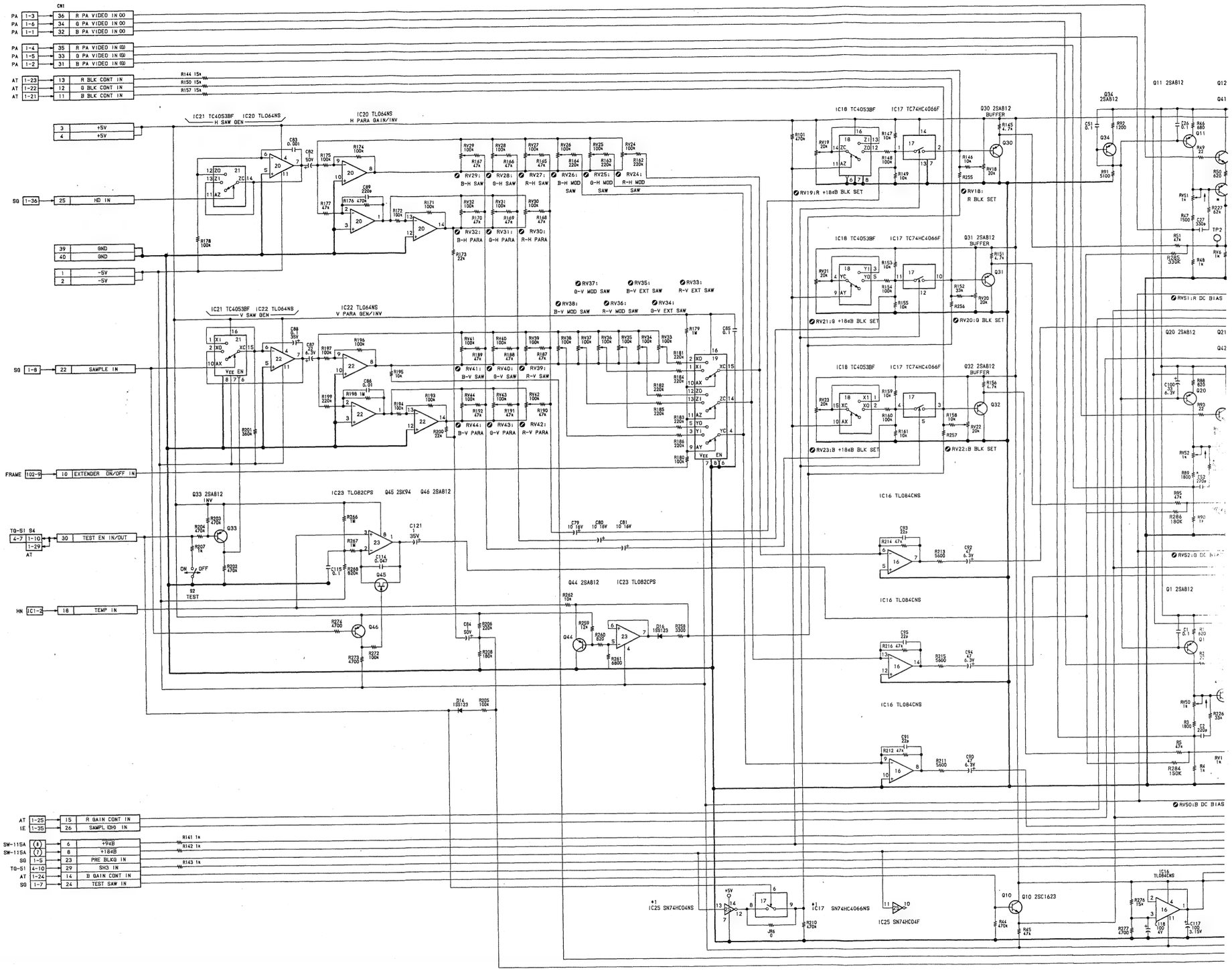
1-630-561-16 SOLDERING SIDE

VA-85 (1-630-561-16)

CN1	I - 2	Q41	H - 6
		Q42	J - 3
CV1	G - 5	Q43	J - 3
CV2	F - 5	Q44	O - 6
CV3	F - 2	Q45	N - 4
		Q46	M - 3
D1	I - 5		
D3	A - 3	RV1	J - 6
D4	A - 4	RV4	B - 4
D5	I - 6	RV5	B - 4
D7	A - 5	RV6	K - 6
D8	A - 5	RV7	L - 6
D10	G - 2	RV8	L - 6
D12	A - 1	RV10	B - 6
D13	A - 2	RV11	A - 6
D14	L - 2	RV12	J - 6
D16	N - 5	RV13	K - 6
		RV16	C - 2
DL1	H - 2	RV17	B - 2
		RV18	O - 6
FL1	I - 3	RV19	N - 3
FL2	H - 5	RV20	N - 6
FL3	I - 3	RV21	N - 2
		RV22	N - 6
IC1	F - 4	RV23	N - 3
IC2	F - 4	RV24	O - 5
IC3	D - 4	RV25	O - 4
IC4	C - 4	RV26	O - 4
IC5	B - 3	RV27	O - 3
IC6	F - 5	RV28	O - 2
IC7	F - 6	RV29	O - 3
IC8	D - 6	RV30	O - 3
IC9	C - 6	RV31	O - 2
IC10	B - 5	RV32	O - 3
IC12	D - 2	RV33	P - 5
IC13	E - 3	RV34	P - 4
IC14	D - 3	RV35	P - 4
IC15	B - 1	RV36	P - 5
IC16	L - 5	RV37	P - 4
IC17	N - 5	RV38	P - 4
IC18	L - 3	RV39	P - 3
IC19	P - 6	RV40	P - 2
IC20	N - 2	RV41	P - 3
IC21	M - 2	RV42	P - 3
IC22	P - 2	RV43	P - 2
IC23	O - 5	RV44	P - 3
IC24	C - 3	RV50	J - 3
IC25	L - 2	RV51	J - 5
IC26	N - 2	RV52	J - 2
		RV53	J - 5
JR3	H - 2	RV54	J - 3
JR4	A - 1	RV55	J - 4
JR6	M - 6		
		S1	J - 1
Q1	K - 4	S2	M - 6
Q2	K - 3	S3	G - 3
Q3	K - 4	S4	C - 2
Q4	H - 4		
Q5	G - 4	TP1	J - 6
Q7	A - 4	TP2	K - 5
Q8	A - 4	TP3	I - 6
Q9	A - 3	TP4	E - 4
Q10	L - 3	TP5	E - 5
Q11	K - 5	TP6	D - 4
Q12	K - 5	TP7	B - 1
Q13	K - 6		
Q14	H - 6		
Q15	G - 6		
Q17	B - 5		
Q18	A - 5		
Q19	A - 5		
Q20	K - 3		
Q21	K - 2		
Q22	K - 3		
Q23	K - 3		
Q24	H - 3		
Q25	F - 3		
Q27	B - 1		
Q28	A - 1		
Q29	A - 1		
Q30	M - 4		
Q31	M - 5		
Q32	M - 3		
Q33	M - 1		
Q34	J - 3		
Q38	H - 5		
Q39	H - 5		
Q40	H - 6		

VA-85 BOARD

GAIN SELECTOR
GAIN CONTROL
KNEE CORRECTION
WHITE/BLACK SHADING CORRECTION

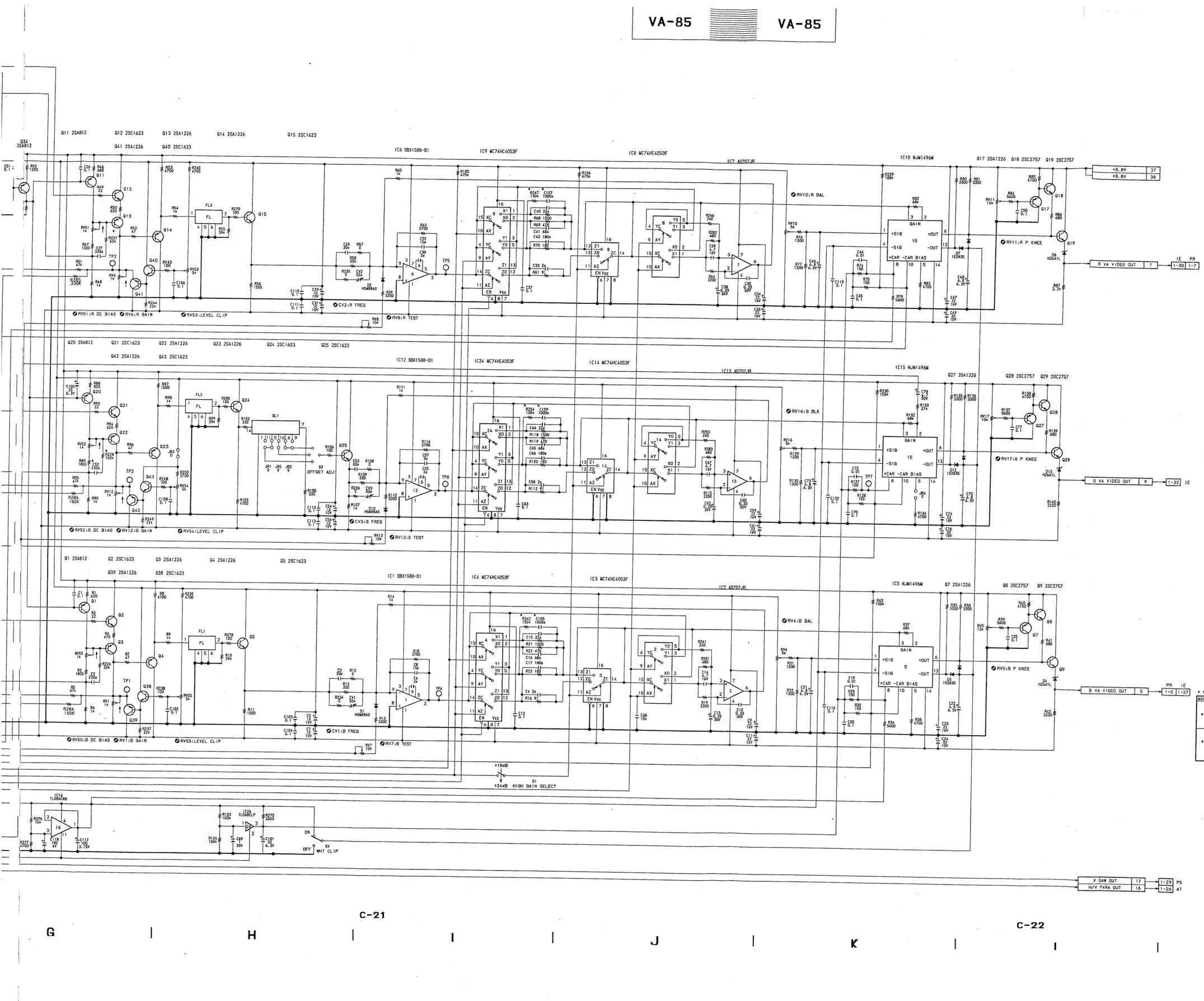


BVP-70 (J, UC)
BVP-70P (EK)

C-19

C-20

A | B | C | D | E | F | G



C-21

C-22

B-BVP70-VA85M

IE-25/25P

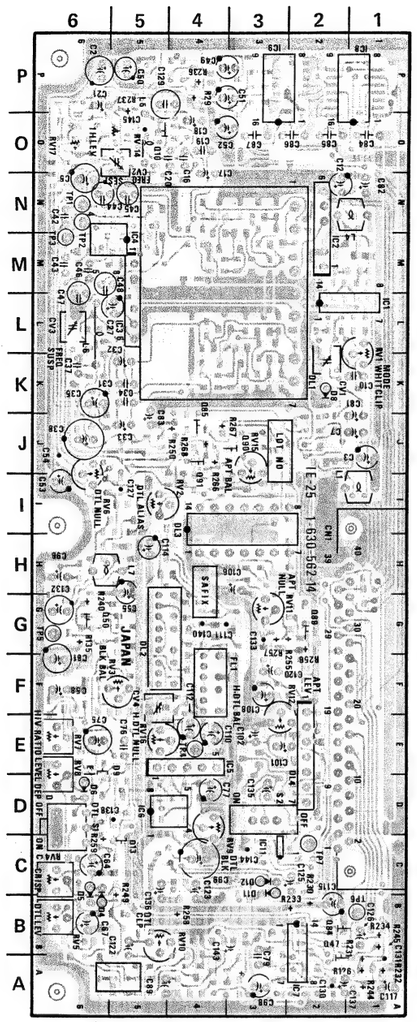
IE-25/25P (1-630-

CN1	H~2
CV1	K~2
CV2	O~6
CV3	L·6
CV4	F·5
D1	G·3
D2	B·4
D3	B·3
D4	B·6
D5	B·6
D6	D·6
D7	B·1
D8	K·2
D9	E·5
D10	F·3
D11	C·3
D12	C·3
D13	C·5
DL1	K·2
DL2	G·5
DL3	I-4
DL4	D·2
FL1	F·3
IC1	L-1
IC2	M·2
IC3	L-5
IC4	M·5
IC5	E-3
IC6	D·5
IC7	A·2
IC8	P-1
IC9	P-3
IC10	P-1
IC11	C-3
Q1	J-2
Q2	J-3
Q3	K-2
Q4	N-3
Q5	N-3
Q6	M-3
Q7	M-4
Q8	N-4
Q9	O-5
Q10	O-5
Q11	O-5
Q12	O-6
Q13	O-6
Q14	N-6
Q15	M-1
Q16	L-3
Q17	L-3
Q18	K-4
Q19	K-4
Q20	L-4
Q21	L-6
Q22	L-5
Q23	J-4
Q24	N-6
Q25	N-5
Q26	N-5
Q27	M-6
Q28	M-6
Q29	M-5
Q30	M-5
Q31	P-4
Q32	P-4
Q33	P-5
Q34	H-4
Q35	H-4
Q36	G-4
Q37	E-5
Q38	E-6
Q39	E-5
Q41	G-5
Q42	G-6
Q43	G-5
Q44	A-6
Q45	B-6
Q47	B-2
Q48	I-5
Q49	I-5
Q50	G-6

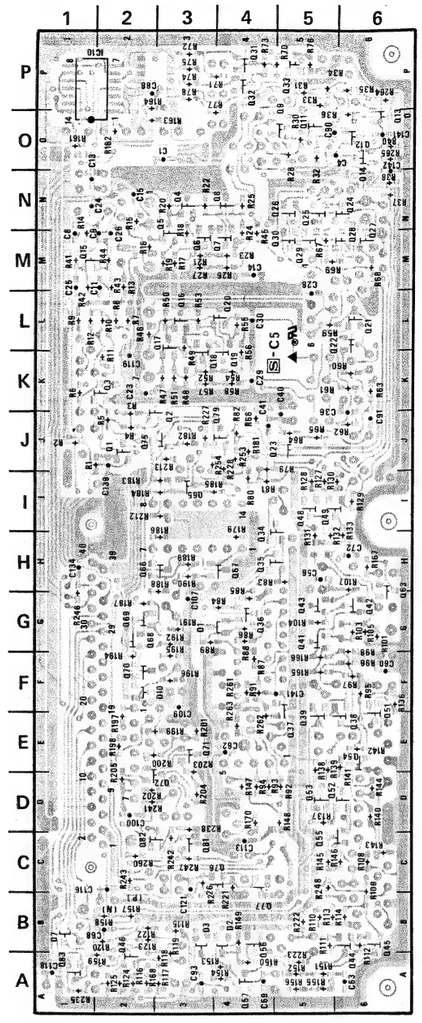
IE-25/25P BOARD

IE-25/25P (1-630-562-14)

CN1	H - 2	Q51	E - 6
		Q52	D - 5
CV1	K - 2	Q53	D - 5
CV2	O - 6	Q54	E - 6
CV3	L - 6	Q55	C - 5
CV4	F - 5	Q56	B - 4
		Q57	A - 4
D1	G - 3	Q63	G - 6
D2	B - 4	Q65	I - 3
D3	B - 3	Q66	H - 2
D4	B - 6	Q67	H - 4
D5	B - 6	Q68	G - 2
D6	D - 6	Q69	G - 2
D7	B - 1	Q70	F - 2
D8	K - 2	Q71	E - 3
D9	E - 5	Q72	D - 3
D10	F - 3	Q75	J - 2
D11	C - 3	Q76	C - 4
D12	C - 3	Q77	B - 4
D13	C - 5	Q79	J - 4
		Q81	C - 3
DL1	K - 2	Q82	C - 2
DL2	G - 5	Q83	A - 1
DL3	I - 4	Q84	B - 2
DL4	D - 2	Q85	K - 4
		Q89	G - 2
FL1	F - 3	Q90	J - 3
		Q91	I - 4
IC1	L - 1		
IC2	M - 2	RV1	K - 1
IC3	L - 5	RV2	I - 4
IC4	M - 5	RV3	F - 5
IC5	E - 3	RV4	C - 6
IC6	D - 5	RV5	B - 6
IC7	A - 2	RV6	I - 6
IC8	P - 1	RV7	E - 6
IC9	P - 3	RV8	E - 6
IC10	P - 1	RV9	C - 3
IC11	C - 3	RV10	B - 5
		RV11	G - 2
Q1	J - 2	RV12	F - 2
Q2	J - 3	RV14	O - 5
Q3	K - 2	RV15	J - 3
Q4	N - 3	RV16	E - 5
Q5	N - 3	RV17	O - 6
Q6	M - 3		
Q7	M - 4	S1	D - 6
Q8	N - 4	S2	D - 3
Q9	O - 5		
Q10	O - 5	TP1	N - 6
Q11	O - 5	TP2	M - 6
Q12	O - 6	TP3	M - 6
Q13	O - 6	TP4	E - 4
Q14	N - 6	TP5	G - 6
Q15	M - 1	TP6	B - 1
Q16	L - 3	TP7	C - 2
Q17	L - 3		
Q18	K - 4		
Q19	K - 4		
Q20	L - 4		
Q21	L - 6		
Q22	L - 5		
Q23	J - 4		
Q24	N - 6		
Q25	N - 5		
Q26	N - 5		
Q27	M - 6		
Q28	M - 6		
Q29	M - 5		
Q30	M - 5		
Q31	P - 4		
Q32	P - 4		
Q33	P - 5		
Q34	H - 4		
Q35	H - 4		
Q36	G - 4		
Q37	E - 5		
Q38	E - 6		
Q39	E - 5		
Q41	G - 5		
Q42	G - 6		
Q43	G - 5		
Q44	A - 6		
Q45	B - 6		
Q47	B - 2		
Q48	I - 5		
Q49	I - 5		
Q50	G - 6		



1-630-562-14 SOLDERING SIDE

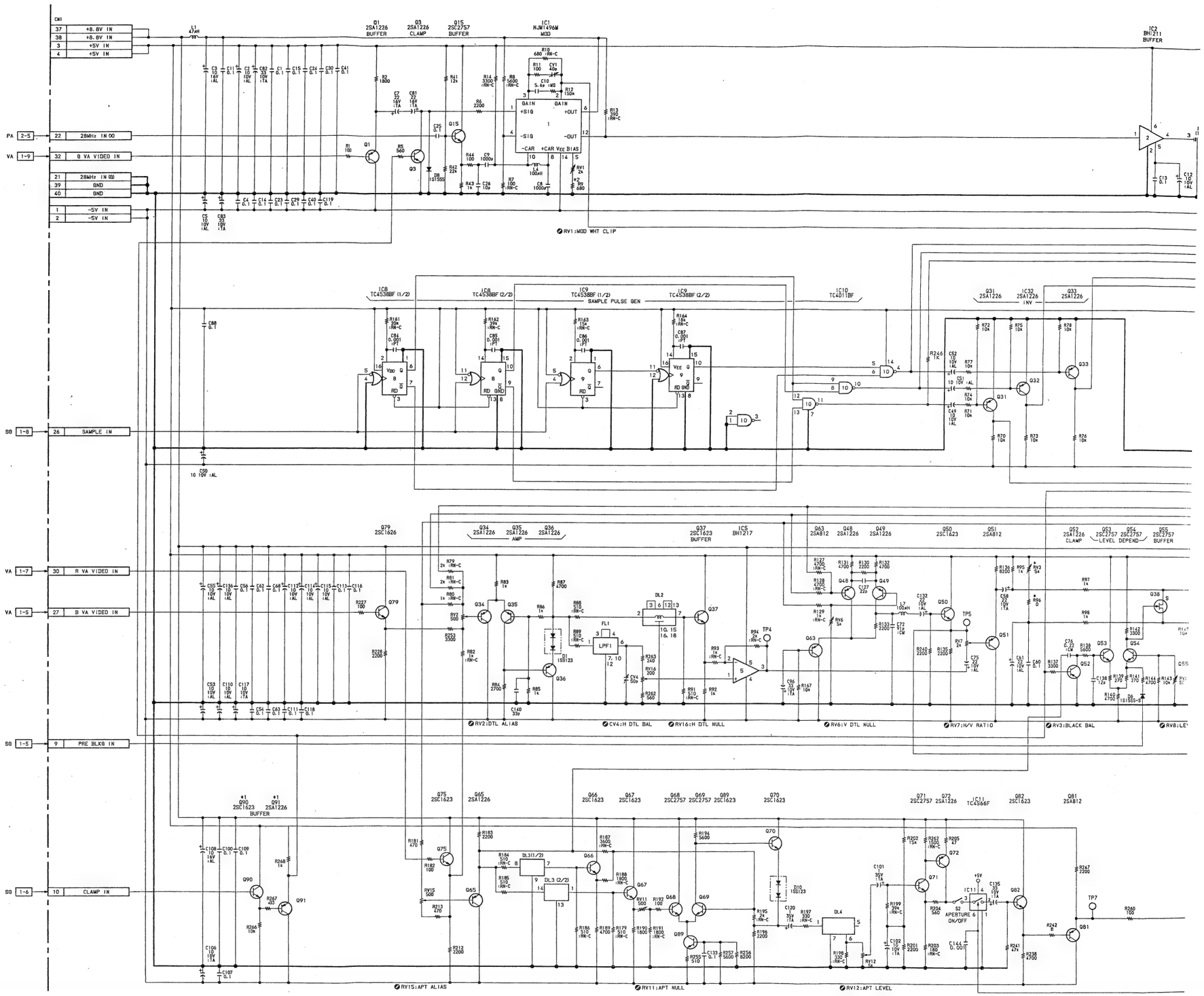


1-630-562-14 SOLDERING SIDE

IE-25/25P (1-630-562-14)

CN1	H - 2	Q51	E - 6
		Q52	D - 5
CV1	K - 2	Q53	D - 5
CV2	O - 6	Q54	E - 6
CV3	L - 6	Q55	C - 5
CV4	F - 5	Q56	B - 4
		Q57	A - 4
D1	G - 3	Q63	G - 6
D2	B - 4	Q65	I - 3
D3	B - 3	Q66	H - 2
D4	B - 6	Q67	H - 4
D5	B - 6	Q68	G - 2
D6	D - 6	Q69	G - 2
D7	B - 1	Q70	F - 2
D8	K - 2	Q71	E - 3
D9	E - 5	Q72	D - 3
D10	F - 3	Q75	J - 2
D11	C - 3	Q76	C - 4
D12	C - 3	Q77	B - 4
D13	C - 5	Q79	J - 4
		Q81	C - 3
DL1	K - 2	Q82	C - 2
DL2	G - 5	Q83	A - 1
DL3	I - 4	Q84	B - 2
DL4	D - 2	Q85	K - 4
		Q89	G - 2
FL1	F - 3	Q90	J - 3
		Q91	I - 4
IC1	L - 1		
IC2	M - 2	RV1	K - 1
IC3	L - 5	RV2	I - 4
IC4	M - 5	RV3	F - 5
IC5	E - 3	RV4	C - 6
IC6	D - 5	RV5	B - 6
IC7	A - 2	RV6	I - 6
IC8	P - 1	RV7	E - 6
IC9	P - 3	RV8	E - 6
IC10	P - 1	RV9	C - 3
IC11	C - 3	RV10	B - 5
		RV11	G - 2
Q1	J - 2	RV12	F - 2
Q2	J - 3	RV14	O - 5
Q3	K - 2	RV15	J - 3
Q4	N - 3	RV16	E - 5
Q5	N - 3	RV17	O - 6
Q6	M - 3		
Q7	M - 4	S1	D - 6
Q8	N - 4	S2	D - 3
Q9	O - 5		
Q10	O - 5	TP1	N - 6
Q11	O - 5	TP2	M - 6
Q12	O - 6	TP3	M - 6
Q13	O - 6	TP4	E - 4
Q14	N - 6	TP5	G - 6
Q15	M - 1	TP6	B - 1
Q16	L - 3	TP7	C - 2
Q17	L - 3		
Q18	K - 4		
Q19	K - 4		
Q20	L - 4		
Q21	L - 6		
Q22	L - 5		
Q23	J - 4		
Q24	N - 6		
Q25	N - 5		
Q26	N - 5		
Q27	M - 6		
Q28	M - 6		
Q29	M - 5		
Q30	M - 5		
Q31	P - 4		
Q32	P - 4		
Q33	P - 5		
Q34	H - 4		
Q35	H - 4		
Q36	G - 4		
Q37	E - 5		
Q38	E - 6		
Q39	E - 5		
Q41	G - 5		
Q42	G - 6		
Q43	G - 5		
Q44	A - 6		
Q45	B - 6		
Q47	B - 2		
Q48	I - 5		
Q49	I - 5		
Q50	G - 6		

IE-25/25P BOARD
IMAGE ENHANCER



* NOTE

MARK	CHANGE INFORMATION		SERIAL NO
*	R96 560 → 0		10274 - (UC)
	RV3 1K → 5K		30431 - (J)
			40432 - (EK)
#1	RS2 150 → 220		11061 - (UC)
			31101 - (J)
			41076 - (EK)
#2	R9 1K → 680		11192 - (UC)
			31276 - (J)
			41313 - (EK)

IE-25 BOARD

BVP-70 (J)
BVP-70 (UC)
BV-70P (EK)

C-29 C-30

G H I J K L M

1 2 3 4 5 6

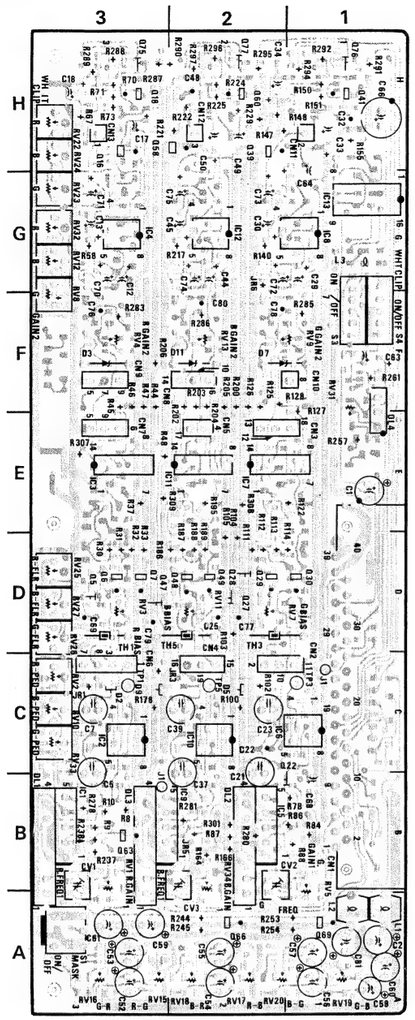
B-BVP70-IE25M

PR-138 BOARD
PR-139 BOARD
PR-140 BOARD

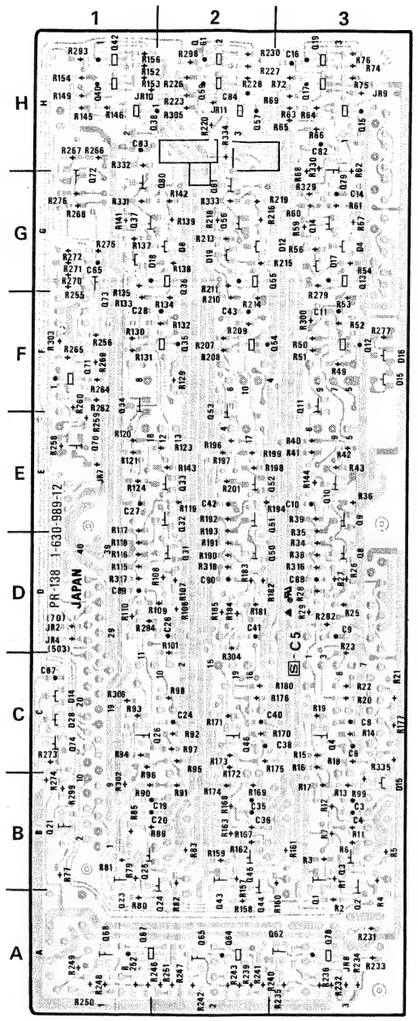
Ser No.10221-11060 (UC)
30356-31100 (J)
40386-41075 (EK)

PR-138 (1-630-989-12)

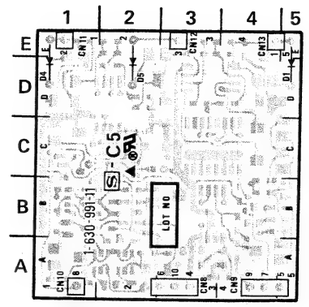
CN1	B - 1	Q28	D - 2	TP1	C - 3
CN2	C - 1	Q29	D - 2	TP3	C - 1
CN3	E - 1	Q30	D - 1	TP5	C - 2
CN4	D - 2	Q31	D - 2		
CN5	E - 2	Q32	E - 2		
CN6	C - 3	Q33	E - 2		
CN7	E - 3	Q34	D - 2		
CN8	F - 2	Q35	F - 2		
CN9	F - 3	Q36	G - 2		
CN10	F - 1	Q37	G - 1		
CN11	H - 1	Q38	H - 1		
CN12	H - 2	Q39	H - 2		
CN13	H - 3	Q40	H - 1		
		Q42	H - 1		
CV1	B - 3	Q43	A - 2		
CV2	B - 1	Q44	A - 2		
CV3	A - 2	Q45	B - 2		
		Q46	C - 2		
D3	F - 3	Q47	D - 3		
D4	G - 3	Q48	D - 2		
D5	C - 2	Q49	D - 2		
D7	F - 2	Q50	D - 2		
D8	G - 2	Q51	E - 3		
D11	F - 2	Q52	E - 3		
D12	G - 3	Q53	F - 2		
D14	C - 1	Q54	F - 2		
D15	B - 3	Q55	G - 2		
D16	F - 3	Q56	G - 2		
D17	G - 3	Q57	H - 2		
D18	G - 1	Q58	H - 3		
D19	G - 2	Q59	H - 2		
D28	C - 1	Q61	H - 2		
		Q62	A - 3		
DL1	B - 3	Q63	B - 3		
DL2	B - 2	Q64	A - 2		
DL3	B - 3	Q65	A - 2		
DL4	E - 1	Q66	A - 2		
		Q67	A - 1		
IC1	B - 3	Q68	A - 1		
IC2	C - 3	Q69	A - 1		
IC3	E - 3	Q70	E - 1		
IC4	G - 3	Q71	F - 1		
IC5	B - 2	Q72	G - 1		
IC6	C - 2	Q73	F - 1		
IC7	E - 2	Q74	C - 1		
IC8	G - 1	Q75	H - 3		
IC9	B - 2	Q76	H - 1		
IC10	C - 2	Q77	H - 2		
IC11	E - 2	Q78	A - 3		
IC12	G - 2				
IC13	G - 1	RV1	B - 3		
		RV2	C - 3		
JR1	C - 2	RV3	D - 3		
JR2	D - 1	RV4	F - 3		
JR3	C - 5	RV5	B - 1		
JR5	B - 2	RV7	D - 1		
JR6	G - 2	RV8	F - 3		
JR7	E - 1	RV9	F - 1		
JR8	A - 3	RV10	C - 3		
JR9	H - 3	RV11	D - 2		
JR10	H - 1	RV12	G - 3		
JR11	H - 2	RV13	F - 2		
		RV15	A - 3		
Q1	A - 3	RV16	A - 3		
Q2	A - 3	RV17	A - 2		
Q3	B - 3	RV18	A - 2		
Q4	C - 3	RV19	A - 1		
Q5	D - 3	RV20	A - 2		
Q6	D - 3	RV22	H - 3		
Q7	D - 3	RV23	G - 3		
Q8	D - 3	RV24	H - 3		
Q9	E - 3	RV25	D - 3		
Q10	E - 3	RV26	D - 3		
Q11	F - 3	RV27	D - 3		
Q12	F - 3	RV31	F - 1		
Q13	G - 3	RV32	G - 3		
Q14	G - 3	RV33	C - 3		
Q15	H - 3	RV34	B - 2		
Q16	H - 3				
Q17	H - 3	S1	A - 3		
Q19	H - 3	S2	F - 1		
Q21	B - 1	S3	F - 1		
Q22	C - 1				
Q23	A - 1	TH1	D - 3		
Q24	A - 2	TH3	D - 2		
Q25	B - 1	TH5	D - 2		
Q26	C - 2				
Q27	D - 2				



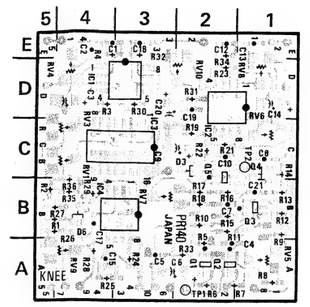
1-630-989-12 SOLDERING SIDE



1-630-989-12 SOLDERING SIDE



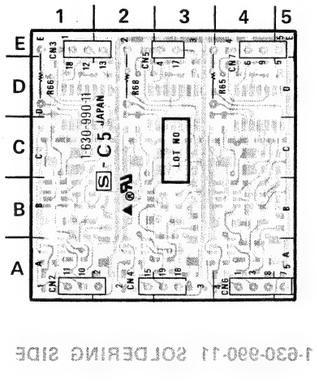
1-630-991-11 SOLDERING SIDE



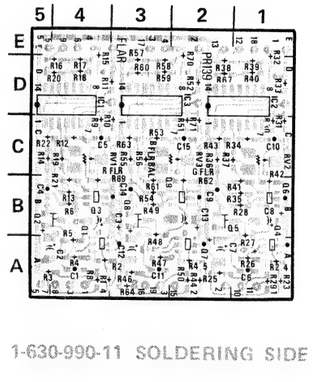
1-630-991-11 SOLDERING SIDE

PR-140 (1-630-991-11)

CN8	A - 3	RV1	C - 4
CN9	A - 4	RV3	C - 4
CN10	A - 1	RV4	D - 5
CN11	E - 1	RV5	A - 1
CN12	E - 3	RV6	D - 1
CN13	E - 4	RV7	B - 3
		RV8	D - 1
D1	D - 5	RV9	A - 4
D3	C - 2	RV10	D - 2
D4	D - 1		
D5	D - 2	TP1	A - 2
D6	B - 4	TP2	C - 1
IC1	D - 4		
IC2	C - 2		
IC3	C - 3		
IC4	B - 4		
Q1	A - 2		
Q2	A - 2		
Q3	B - 1		
Q4	C - 1		
Q5	C - 2		



1-630-990-11 SOLDERING SIDE



1-630-990-11 SOLDERING SIDE

PR-139 (1-630-990-11)

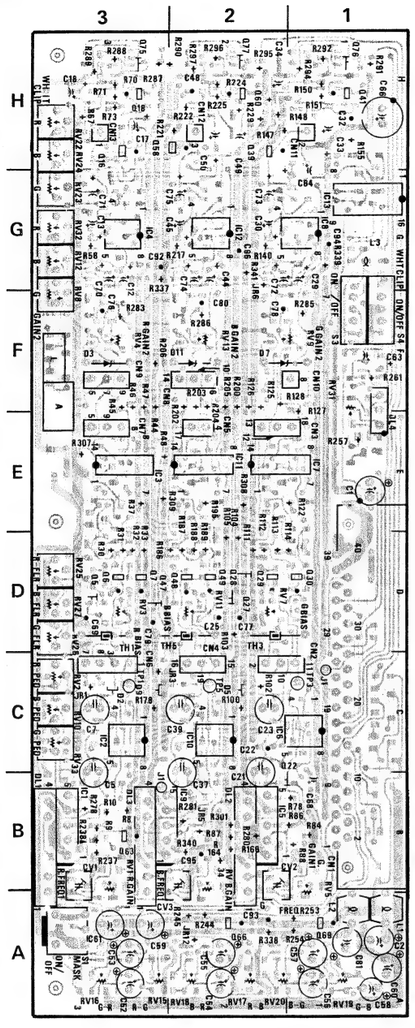
CN2	A - 1	RV1	C - 3
CN3	E - 1	RV2	C - 1
CN4	A - 2	RV3	C - 2
CN5	D - 2		
CN6	A - 4		
CN7	D - 4		
IC1	D - 4		
IC2	D - 1		
IC3	D - 2		
Q1	B - 4		
Q2	B - 5		
Q3	B - 4		
Q4	B - 1		
Q5	B - 1		
Q6	B - 1		
Q7	A - 2		
Q8	B - 3		
Q9	B - 3		

PR-138 BOARD
PR-139 BOARD
PR-140 BOARD

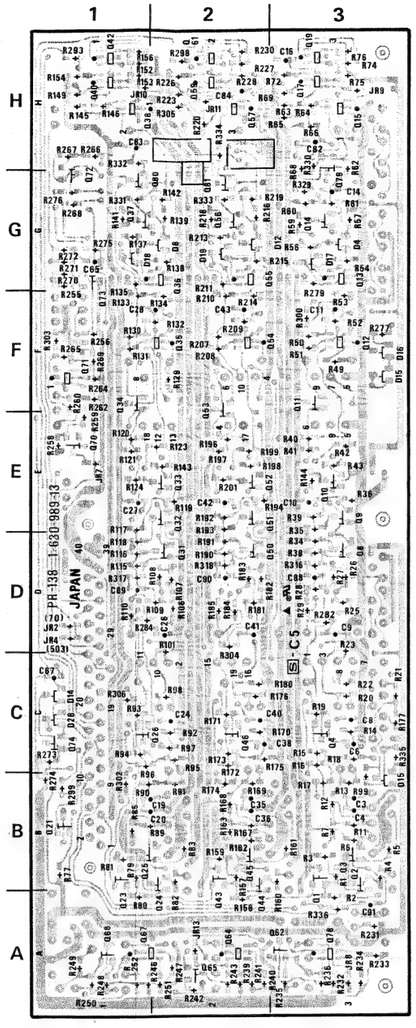
Ser No.11061- (UC)
31101- (J)
41076- (EK)

PR-138 (1-630-989-13)

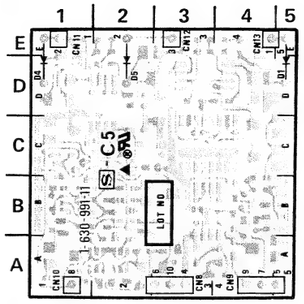
CN1	B - 1	Q26	C - 2	TP1	C - 3
CN2	C - 1	Q27	D - 2	TP3	C - 1
CN3	E - 1	Q28	D - 2	TP5	C - 2
CN4	D - 2	Q29	D - 2		
CN5	E - 2	Q30	D - 1		
CN6	C - 3	Q31	D - 2		
CN7	E - 3	Q32	E - 2		
CN8	F - 3	Q33	E - 2		
CN9	F - 3	Q34	F - 1		
CN10	F - 1	Q35	F - 2		
CN11	H - 1	Q36	G - 2		
CN12	H - 2	Q37	G - 1		
CN13	H - 3	Q38	H - 1		
		Q39	H - 2		
CV1	B - 3	Q40	H - 1		
CV2	B - 1	Q42	H - 1		
CV3	A - 2	Q43	A - 2		
		Q44	A - 2		
D3	F - 3	Q45	B - 2		
D4	G - 3	Q46	C - 2		
D5	C - 2	Q47	D - 3		
D7	F - 2	Q48	D - 2		
D8	G - 2	Q49	D - 2		
D11	F - 2	Q50	D - 3		
D12	G - 3	Q51	E - 3		
D14	C - 1	Q52	E - 3		
D15	B - 3	Q53	E - 2		
D16	F - 3	Q54	F - 3		
D17	G - 3	Q55	G - 2		
D18	G - 1	Q56	G - 2		
D19	G - 2	Q57	H - 2		
D28	C - 1	Q58	H - 3		
		Q59	H - 2		
DL1	B - 3	Q61	H - 2		
DL2	B - 2	Q62	A - 3		
DL3	B - 3	Q63	B - 3		
DL4	E - 1	Q64	A - 2		
		Q65	A - 2		
IC1	B - 3	Q66	A - 2		
IC2	C - 3	Q67	A - 1		
IC3	E - 3	Q68	A - 1		
IC4	G - 3	Q69	A - 1		
IC5	B - 2	Q70	E - 1		
IC6	C - 2	Q71	F - 1		
IC7	E - 1	Q72	G - 1		
IC8	G - 1	Q73	F - 1		
IC9	B - 2	Q74	C - 1		
IC10	C - 2	Q75	H - 3		
IC11	E - 2	Q76	H - 1		
IC12	G - 2	Q77	H - 2		
IC13	G - 1	Q78	A - 3		
JR1	C - 3	RV1	B - 3		
JR2	D - 1	RV2	C - 3		
JR3	C - 2	RV3	D - 3		
JR5	B - 2	RV4	F - 3		
JR6	G - 2	RV5	B - 1		
JR7	E - 1	RV7	D - 2		
JR8	A - 3	RV8	F - 3		
JR9	H - 3	RV9	F - 1		
JR10	H - 1	RV10	C - 3		
JR11	H - 2	RV11	D - 2		
JR12	A - 2	RV12	G - 3		
JR13	A - 2	RV13	F - 2		
		RV15	A - 3		
Q1	A - 3	RV16	A - 3		
Q2	B - 3	RV17	A - 2		
Q3	B - 3	RV18	A - 2		
Q4	C - 3	RV19	A - 1		
Q5	D - 3	RV20	A - 2		
Q6	D - 3	RV22	H - 3		
Q7	D - 3	RV23	G - 3		
Q8	D - 3	RV24	H - 3		
Q9	E - 3	RV25	D - 3		
Q10	E - 3	RV26	D - 3		
Q11	F - 3	RV27	D - 3		
Q12	F - 3	RV31	F - 1		
Q13	G - 3	RV32	G - 3		
Q14	G - 3	RV33	C - 3		
Q15	H - 3	RV34	B - 2		
Q16	H - 3				
Q17	H - 3	S1	A - 3		
Q19	H - 3	S3	F - 1		
Q21	B - 1	S4	F - 1		
Q22	C - 1				
Q23	A - 1	TH1	D - 3		
Q24	A - 2	TH3	D - 2		
Q25	B - 1	TH5	D - 2		



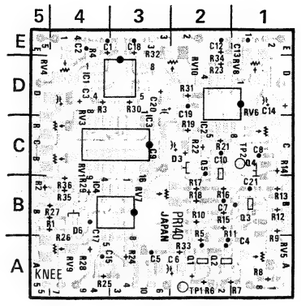
1-630-989-13 SOLDERING SIDE



1-630-989-13 SOLDERING SIDE



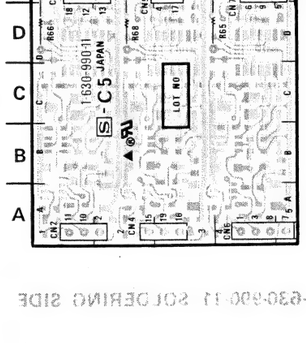
1-630-991-11 SOLDERING SIDE



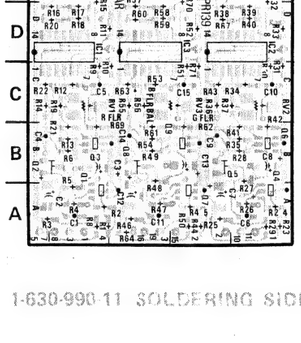
1-630-991-11 SOLDERING SIDE

PR-140 (1-630-991-11)

CN8	A - 3	IC1	D - 4
CN9	A - 4	IC2	C - 2
CN10	A - 1	IC3	C - 3
CN11	E - 1	IC4	B - 4
CN12	E - 3		
CN13	E - 4	Q1	A - 2
		Q2	A - 2
D1	D - 5	Q3	B - 1
D3	C - 2	Q4	C - 1
D4	D - 1	Q5	C - 2
D5	D - 2		
D6	B - 4	RV1	C - 4
		RV3	C - 4
		RV4	D - 5
		RV5	A - 1
		RV6	D - 1
		RV7	B - 3
		RV8	D - 1
		RV9	A - 4
		RV10	D - 2
		TP1	A - 2
		TP2	C - 1



1-630-990-11 SOLDERING SIDE



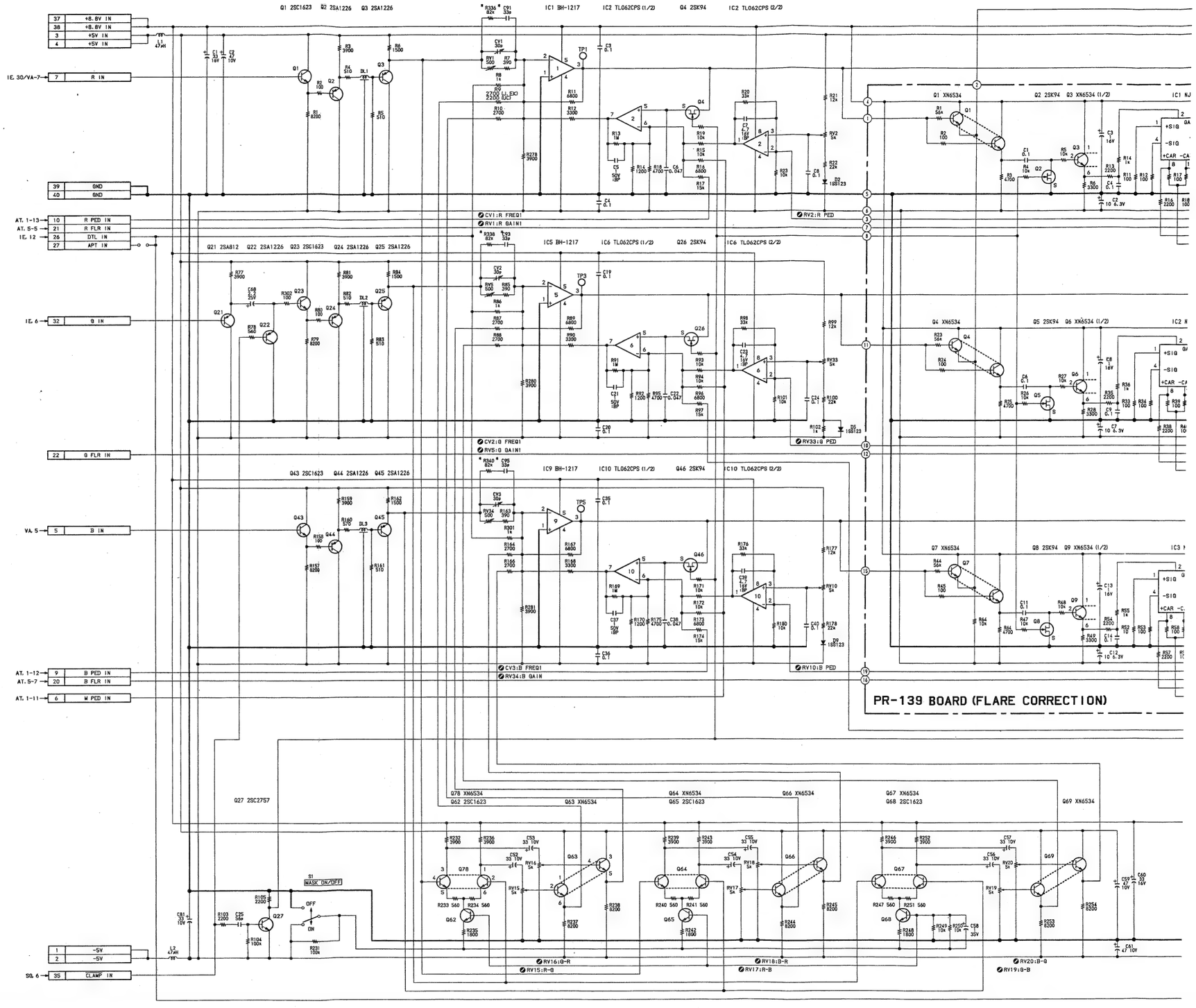
1-630-990-11 SOLDERING SIDE

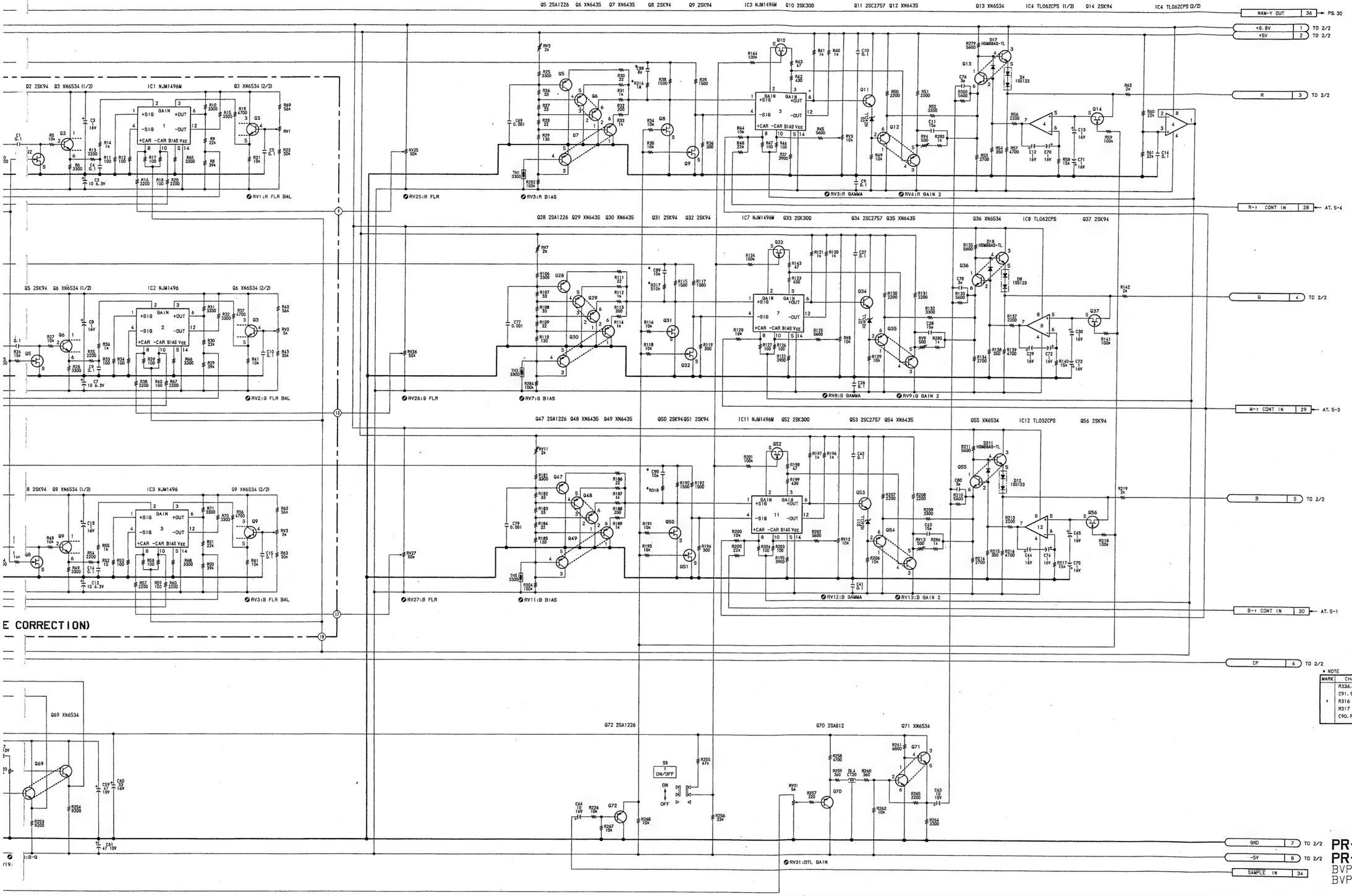
PR-139 (1-630-990-11)

CN2	A - 1	IC1	D - 4
CN3	E - 1	IC2	D - 1
CN4	A - 2	IC3	D - 2
CN5	D - 2		
CN6	A - 4	Q1	B - 4
CN7	D - 4	Q2	B - 5
		Q3	B - 4
		Q4	B - 1
		Q5	B - 1
		Q6	B - 1
		Q7	A - 2
		Q8	B - 3
		Q9	B - 3
		RV1	C - 3
		RV2	C - 1
		RV3	C - 2

PR-138 (1/2) PR-139

PR-138 (1/2) BOARD
PR-139 BOARD





* NOTE

MARK	CHANGE INFORMATION		SERIAL NO
	R336. 338. 340 →	ADD	11061 - (UC)
	C91. 93. 95 →	ADD	31101 - (J)
*	R316 240K →	1M	41076 - (EK)
	R317 200K →	510K	
	C90. R318 →	DELETE	

PR-138 (1/2) BOARD
PR-139 BOARD
BVP-70 (J/UC)
BVP-70P (EK)

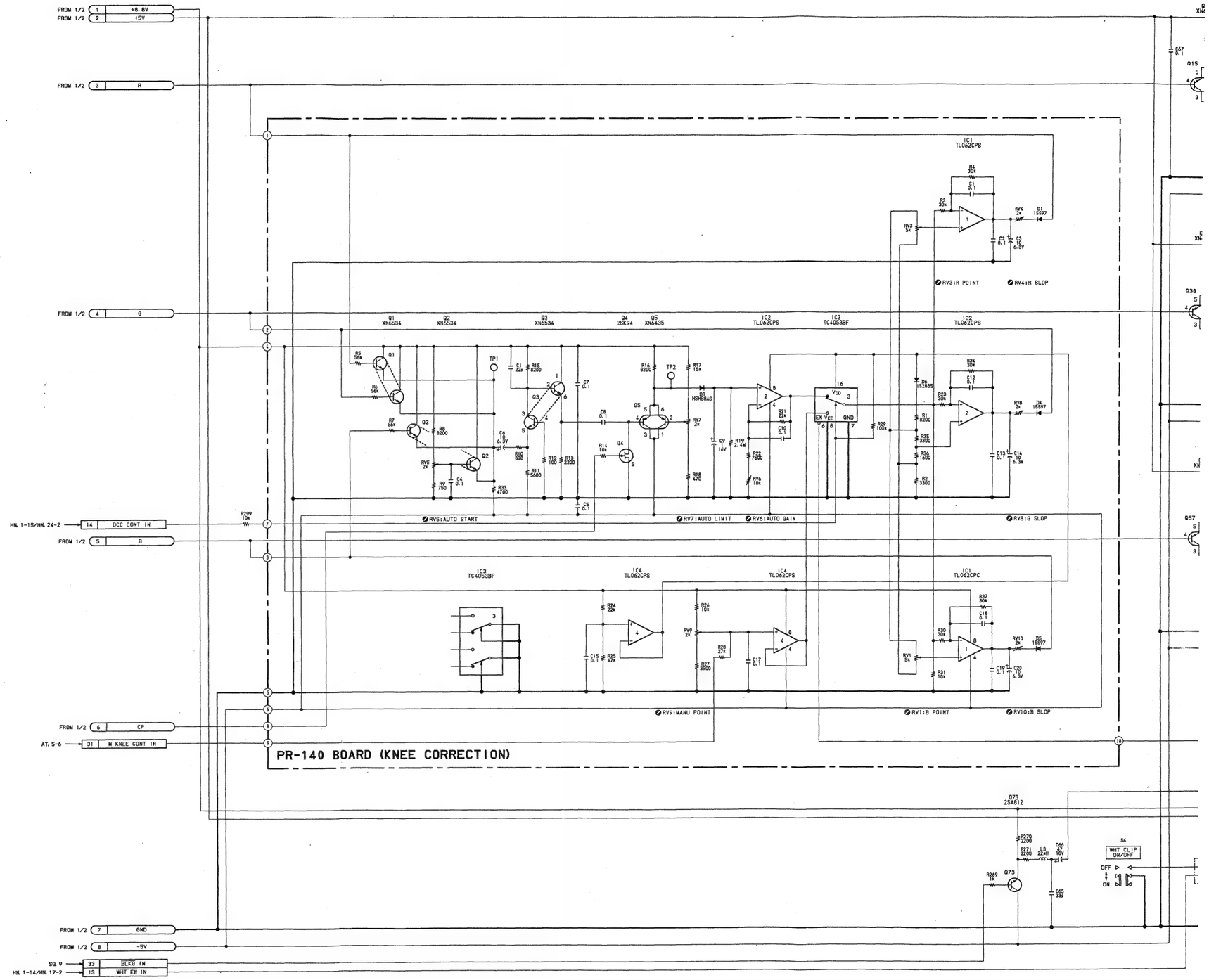
C-37-1 C-38-1

G H I J K L M

B-BVP70-PR138M#

PR-138 (2/2) PR-140

PR-138 (2/2) BOARD
PR-140 BOARD



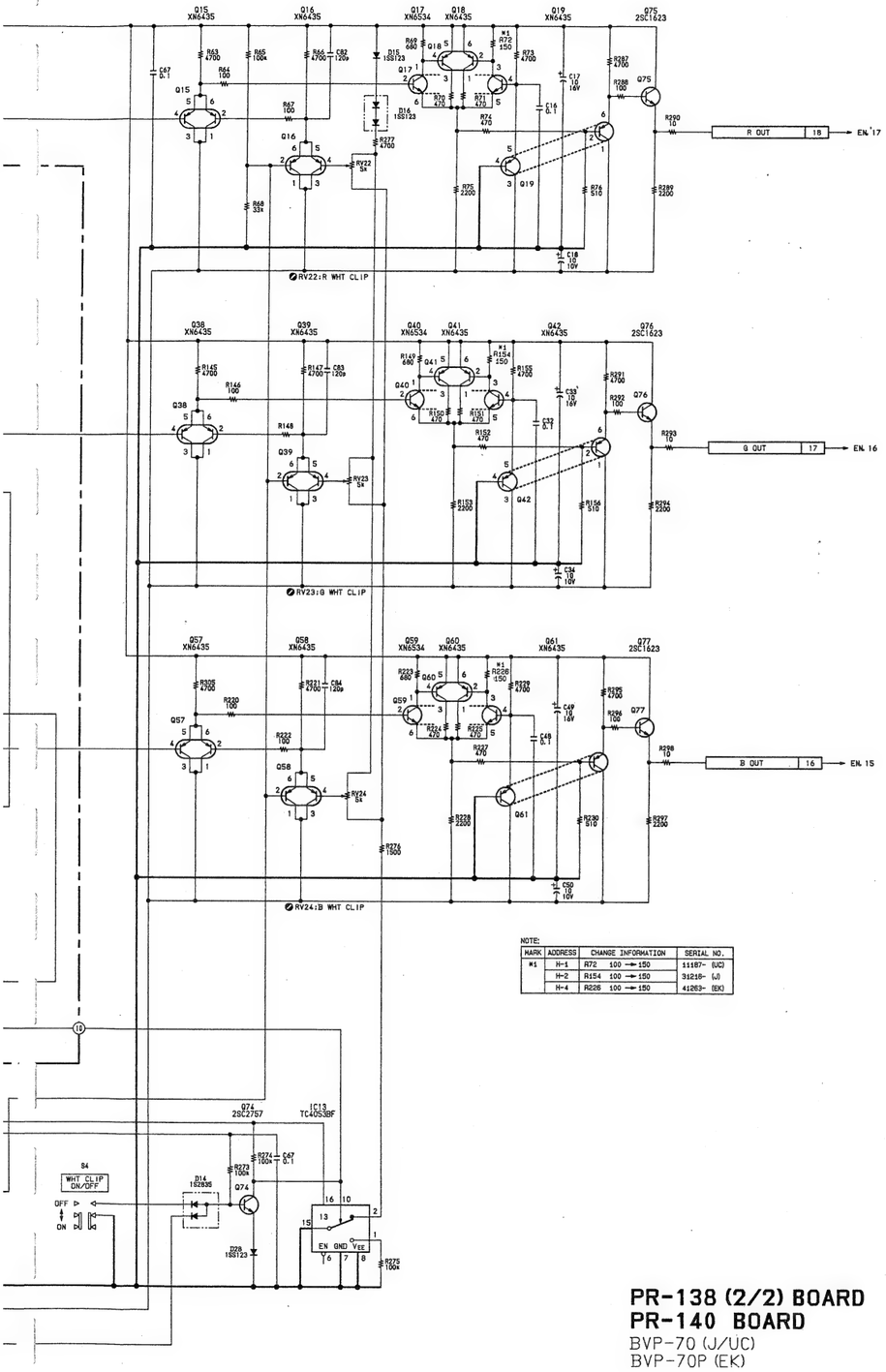
BVP-70 (J/UC)
BVP-70P (EK)

C-35-2

C-36-2

A | B | C | D | E | F | G

PR-138 (2/2) PR-140



NOTE:

MARK	ADDRESS	CHANGE INFORMATION	SERIAL NO.
※1	H-1	R72 100 → 150	11187- (UC)
	H-2	R154 100 → 150	31218- (J)
	H-4	R226 100 → 150	41263- (EK)

PR-138 (2/2) BOARD
PR-140 BOARD
BVP-70 (J/UC)
BVP-70P (EK)

C-37-2

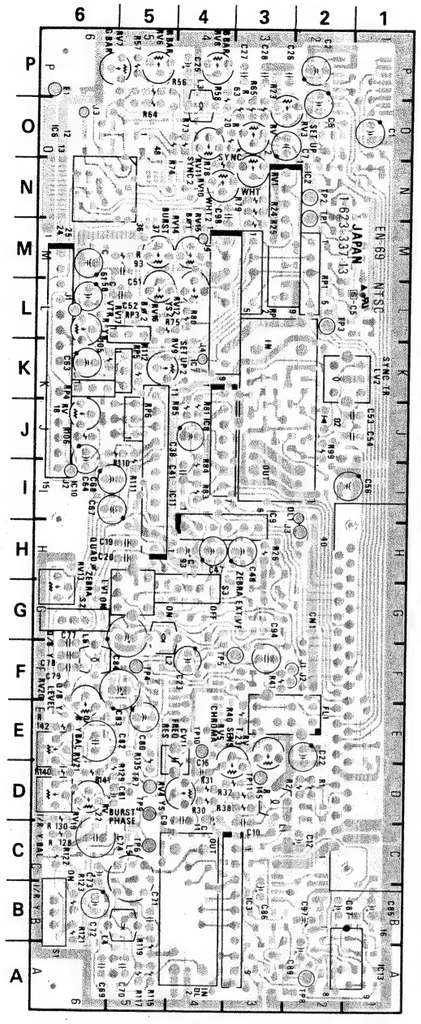
C-38-2

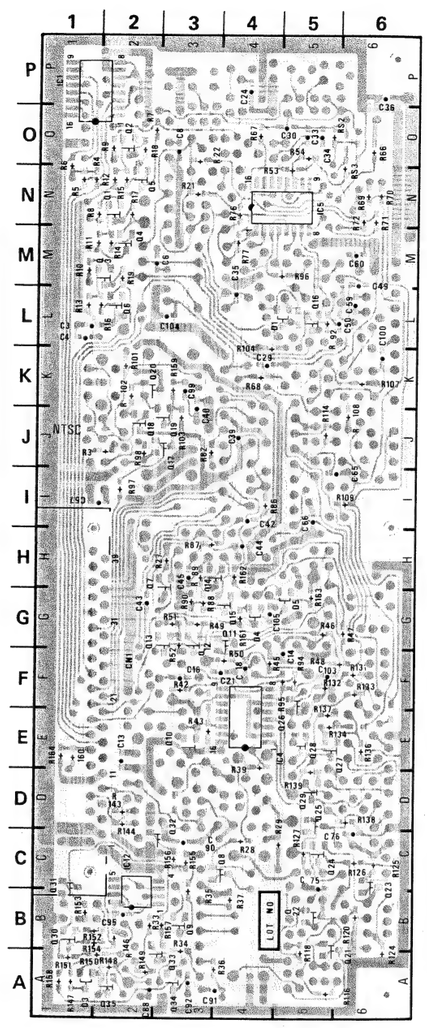
B-BVP70-PR138M#1SS

EN-69 BOARD

EN-69 (1-623-337-13)

CN1	F - 1
CV11	E - 4
D1	L - 5
D2	J - 2
D3	A - 1
D4	G - 4
D5	G - 5
DL1	J - 3
DL2	B - 4
E1	P - 6
FL1	E - 2
IC1	P - 1
IC2	M - 3
IC3	B - 3
IC4	E - 4
IC5	N - 4
IC6	N - 6
IC7	L - 4
IC8	J - 4
IC9	H - 4
IC10	K - 6
IC11	I - 5
IC12	B - 2
IC13	A - 1
LV1	G - 5
LV2	K - 1
Q1	N - 2
Q2	O - 2
Q3	M - 2
Q4	M - 2
Q5	N - 2
Q6	L - 2
Q7	H - 3
Q8	C - 4
Q9	B - 3
Q10	E - 3
Q11	G - 4
Q12	G - 3
Q13	G - 3
Q14	H - 3
Q15	G - 4
Q16	L - 5
Q17	J - 3
Q18	J - 2
Q19	J - 3
Q20	K - 2
Q21	A - 5
Q22	B - 5
Q23	C - 6
Q24	C - 5
Q25	D - 5
Q26	F - 5
Q27	E - 5
Q28	E - 5
Q29	D - 5
Q30	B - 1
Q31	C - 1
Q32	C - 3
Q33	A - 3
Q34	A - 3
Q35	A - 2
RP1	M - 6
RP2	M - 3
RP3	L - 5
RP4	K - 6
RP5	K - 5
RP6	J - 5
RV1	N - 3
RV2	O - 3
RV3	O - 3
RV4	D - 4
RV5	D - 3
RV6	P - 5
RV7	P - 6
RV8	P - 4
RV9	K - 5
RV10	N - 4
RV11	O - 4
RV12	L - 4
RV13	G - 6
RV14	M - 5
RV15	M - 4
RV16	L - 5
RV17	L - 6
RV18	J - 6
RV19	D - 6
RV20	E - 6
RV21	E - 6
RV22	D - 6
RV23	E - 3
S1	B - 6
S2	G - 6
S3	G - 4
TP1	N - 2
TP2	N - 2
TP3	L - 2
TP4	F - 5
TP5	F - 3
TP6	C - 5
TP7	D - 5
TP8	A - 2
TP9	D - 5
TP10	E - 4
TP11	D - 3





EN-69 (1-623-337-13)

CN1	F - 1
CV11	E - 4
D1	L - 5
D2	J - 2
D3	A - 1
D4	G - 4
D5	G - 5
DL1	J - 3
DL2	B - 4
E1	P - 6
FL1	E - 2
IC1	P - 1
IC2	M - 3
IC3	B - 3
IC4	E - 4
IC5	N - 4
IC6	N - 6
IC7	L - 4
IC8	J - 4
IC9	H - 4
IC10	K - 6
IC11	I - 5
IC12	B - 2
IC13	A - 1
LV1	G - 5
LV2	K - 1
Q1	N - 2
Q2	O - 2
Q3	M - 2
Q4	M - 2
Q5	N - 2
Q6	L - 2
Q7	H - 3
Q8	C - 4
Q9	B - 3
Q10	E - 3
Q11	G - 4
Q12	G - 3
Q13	G - 3
Q14	H - 3
Q15	G - 4
Q16	L - 5
Q17	J - 3
Q18	J - 2
Q19	J - 3
Q20	K - 2
Q21	A - 5
Q22	B - 5
Q23	C - 6
Q24	C - 5
Q25	D - 5
Q26	F - 5
Q27	E - 5
Q28	E - 5
Q29	D - 5
Q30	B - 1
Q31	C - 1
Q32	C - 3
Q33	A - 3
Q34	A - 3
Q35	A - 2
RP1	M - 6
RP2	M - 3
RP3	L - 5
RP4	K - 6
RP5	K - 5
RP6	J - 5
RV1	N - 3
RV2	O - 3
RV3	O - 3
RV4	D - 4
RV5	D - 3
RV6	P - 5
RV7	P - 6
RV8	P - 4
RV9	K - 5
RV10	N - 4
RV11	O - 4
RV12	L - 4
RV13	G - 6
RV14	M - 5
RV15	M - 4
RV16	L - 5
RV17	L - 6
RV18	J - 6
RV19	D - 6
RV20	E - 6
RV21	E - 6
RV22	D - 6
RV23	E - 3
S1	B - 6
S2	G - 6
S3	G - 4
TP1	N - 2
TP2	N - 2
TP3	L - 2
TP4	F - 5
TP5	F - 3
TP6	C - 5
TP7	D - 5
TP8	A - 2
TP9	D - 5
TP10	E - 4
TP11	D - 3

EN-69P BI

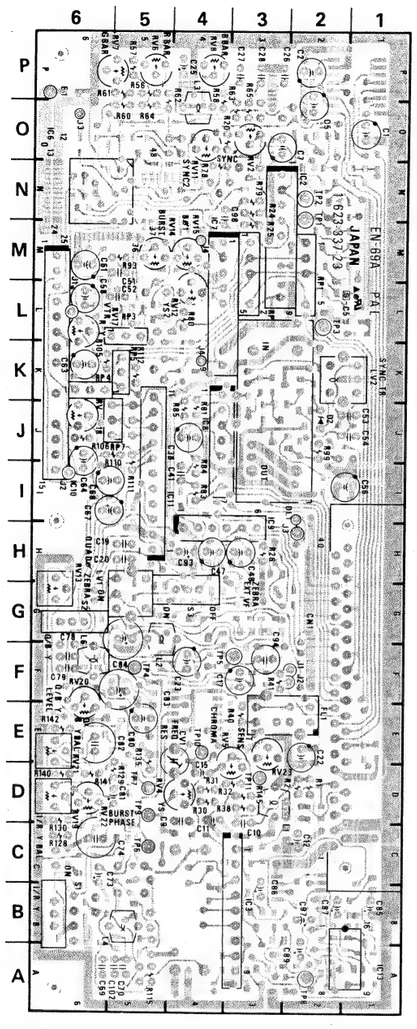
EN-69P (1-623-3

CN1	G - 2
CV11	E - 4
D2	J - 2
D3	A - 1
D4	G - 4
D5	G - 5
DL1	J - 3
E1	P - 6
FL1	E - 2
IC1	P - 1
IC2	M - 3
IC3	B - 3
IC4	E - 4
IC5	N - 5
IC6	N - 6
IC7	L - 4
IC8	J - 4
IC9	H - 3
IC10	K - 6
IC11	I - 5
IC12	C - 1
IC13	A - 1
LV1	G - 5
LV2	K - 2
Q1	N - 2
Q2	O - 2
Q3	M - 2
Q4	M - 2
Q5	N - 2
Q6	L - 2
Q7	H - 3
Q8	C - 4
Q9	B - 3
Q10	E - 3
Q11	G - 4
Q12	G - 3
Q13	G - [illegible]
Q14	H - 3
Q15	G - 4
Q16	L - 5
Q17	J - 3
Q18	J - 2
Q19	J - 3
Q20	K - 2
Q21	A - 5
Q25	D - 5
Q26	F - 5
Q27	E - 5
Q28	E - 5
Q29	D - [illegible]
Q30	B - 1
Q31	C - 1
Q32	C - 3
Q33	A - 3
Q34	A - 3
Q35	A - 2
RP1	M - 6
RP2	M - 3
RP3	L - 5
RP4	K - 6
RP5	K - 5
RP6	J - 5
RP7	J - 5

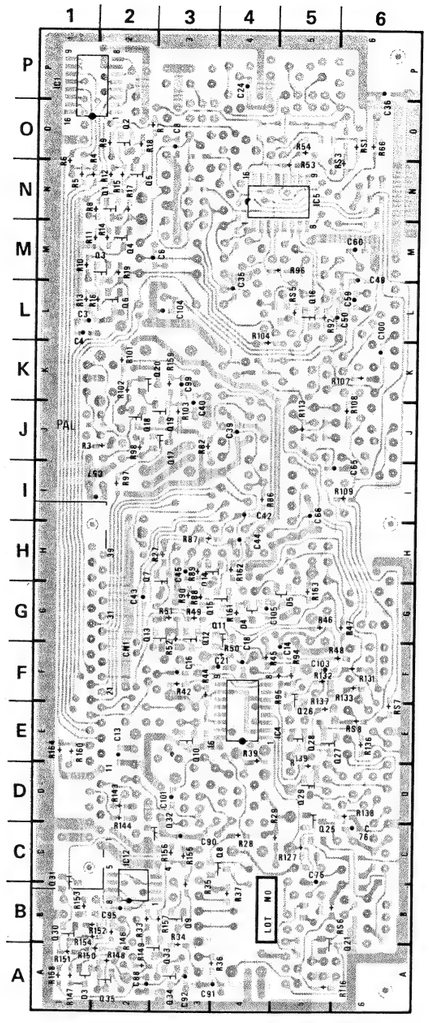
EN-69P BOARD

EN-69P (1-623-337-23)

CN1	G - 2	RV2	O - 3
		RV4	D - 4
CV11	E - 4	RV5	E - 3
		RV6	P - 5
D2	J - 2	RV7	P - 5
D3	A - 1	RV8	P - 4
D4	G - 4	RV11	O - 4
D5	G - 5	RV12	L - 4
		RV13	G - 6
DL1	J - 3	RV14	M - 5
		RV15	M - 4
E1	P - 6	RV16	L - 5
		RV17	L - 6
FL1	E - 2	RV18	J - 6
		RV19	D - 6
IC1	P - 1	RV20	E - 6
IC2	M - 3	RV21	E - 6
IC3	B - 3	RV22	D - 6
IC4	E - 4	RV23	E - 3
IC5	N - 5		
IC6	N - 6	S1	B - 6
IC7	L - 4	S2	G - 6
IC8	J - 4	S3	G - 4
IC9	H - 3		
IC10	K - 6	TP1	N - 2
IC11	I - 5	TP2	N - 2
IC12	C - 1	TP3	L - 2
IC13	A - 1	TP4	F - 5
		TP5	F - 3
LV1	G - 5	TP6	C - 5
LV2	K - 2	TP7	D - 5
		TP8	A - 2
Q1	N - 2	TP9	D - 5
Q2	O - 2	TP10	E - 4
Q3	M - 2	TP11	D - 3
Q4	M - 2		
Q5	N - 2		
Q6	L - 2		
Q7	H - 3		
Q8	C - 4		
Q9	B - 3		
Q10	E - 3		
Q11	G - 4		
Q12	G - 3		
Q13	G - 3		
Q14	H - 3		
Q15	G - 4		
Q16	L - 5		
Q17	J - 3		
Q18	J - 2		
Q19	J - 3		
Q20	K - 2		
Q21	A - 5		
Q25	D - 5		
Q26	F - 5		
Q27	E - 5		
Q28	E - 5		
Q29	D - 5		
Q30	B - 1		
Q31	C - 1		
Q32	C - 3		
Q33	A - 3		
Q34	A - 3		
Q35	A - 2		
RP1	M - 6		
RP2	M - 3		
RP3	L - 5		
RP4	K - 6		
RP5	K - 5		
RP6	J - 5		
RP7	J - 5		



1-623-337-23 SOLDERING SIDE

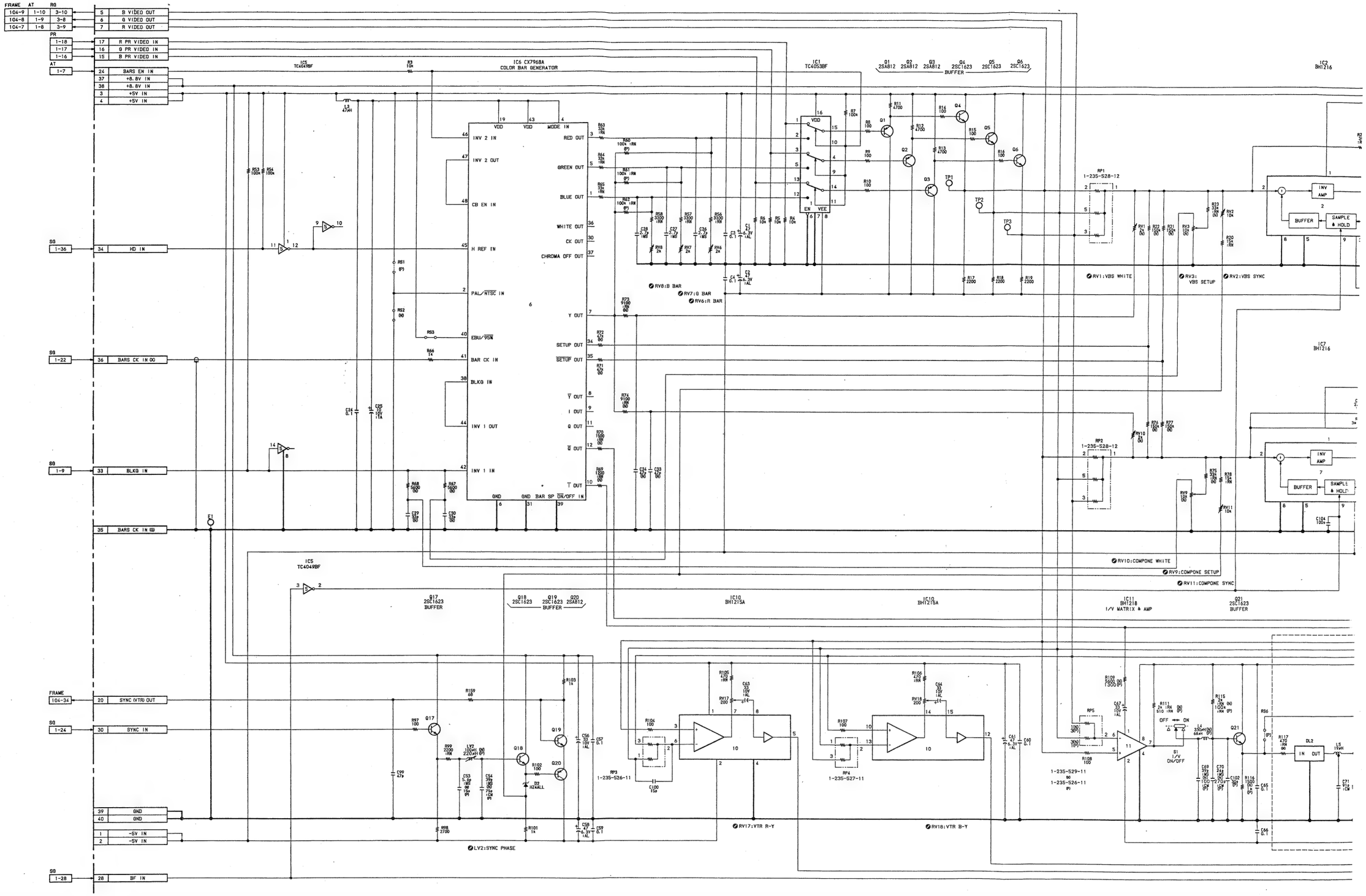


1-623-337-23 SOLDERING SIDE

EN-69P (1-623-337-23)

CN1	G - 2	RV2	O - 3
		RV4	D - 4
CV11	E - 4	RV5	E - 3
		RV6	P - 5
D2	J - 2	RV7	P - 5
D3	A - 1	RV8	P - 4
D4	G - 4	RV11	O - 4
D5	G - 5	RV12	L - 4
		RV13	G - 6
DL1	J - 3	RV14	M - 5
		RV15	M - 4
E1	P - 6	RV16	L - 5
		RV17	L - 6
FL1	E - 2	RV18	J - 6
		RV19	D - 6
IC1	P - 1	RV20	E - 6
IC2	M - 3	RV21	E - 6
IC3	B - 3	RV22	D - 6
IC4	E - 4	RV23	E - 3
IC5	N - 5		
IC6	N - 6	S1	B - 6
IC7	L - 4	S2	G - 6
IC8	J - 4	S3	G - 4
IC9	H - 3		
IC10	K - 6	TP1	N - 2
IC11	I - 5	TP2	N - 2
IC12	C - 1	TP3	L - 2
IC13	A - 1	TP4	F - 5
		TP5	F - 3
LV1	G - 5	TP6	C - 5
LV2	K - 2	TP7	D - 5
		TP8	A - 2
Q1	N - 2	TP9	D - 5
Q2	O - 2	TP10	E - 4
Q3	M - 2	TP11	D - 3
Q4	M - 2		
Q5	N - 2		
Q6	L - 2		
Q7	H - 3		
Q8	C - 4		
Q9	B - 3		
Q10	E - 3		
Q11	G - 4		
Q12	G - 3		
Q13	G - 3		
Q14	H - 3		
Q15	G - 4		
Q16	L - 5		
Q17	J - 3		
Q18	J - 2		
Q19	J - 3		
Q20	K - 2		
Q21	A - 5		
Q25	D - 5		
Q26	F - 5		
Q27	E - 5		
Q28	E - 5		
Q29	D - 5		
Q30	B - 1		
Q31	C - 1		
Q32	C - 3		
Q33	A - 3		
Q34	A - 3		
Q35	A - 2		
RP1	M - 6		
RP2	M - 3		
RP3	L - 5		
RP4	K - 6		
RP5	K - 5		
RP6	J - 5		
RP7	J - 5		

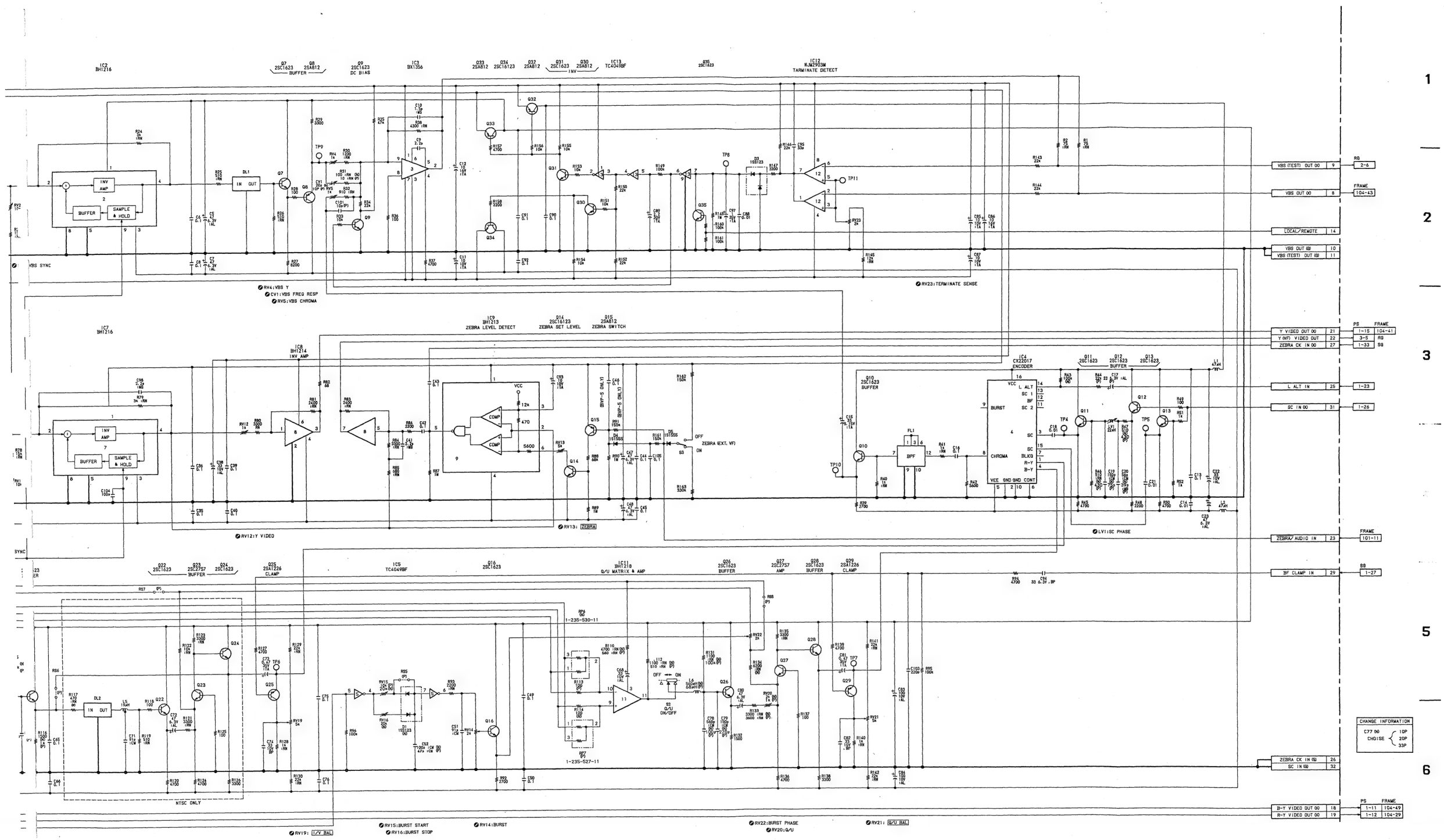
EN-69/69P BOARD
ENCODER



C-43 C-44

BVP-70 (J, UC)
BVP-70P (EK)

A | B | C | D | E | F | G



C-45 C-46

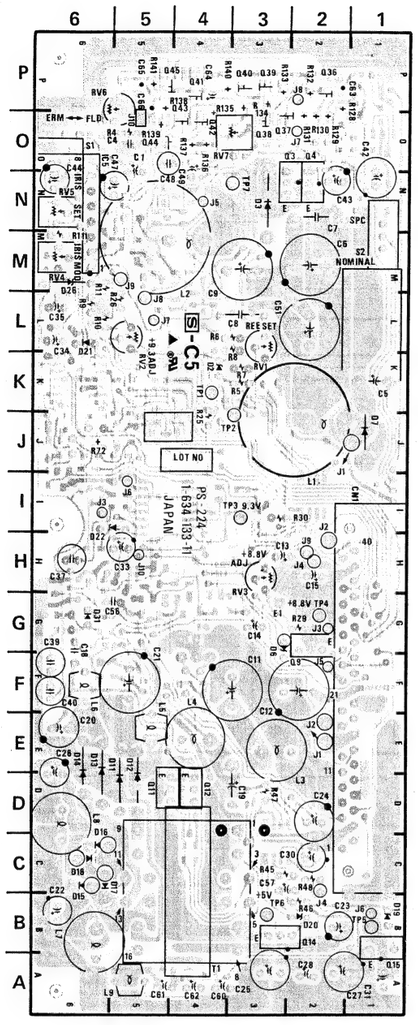
B-BVP70-EN69M

PS-224 BOARD

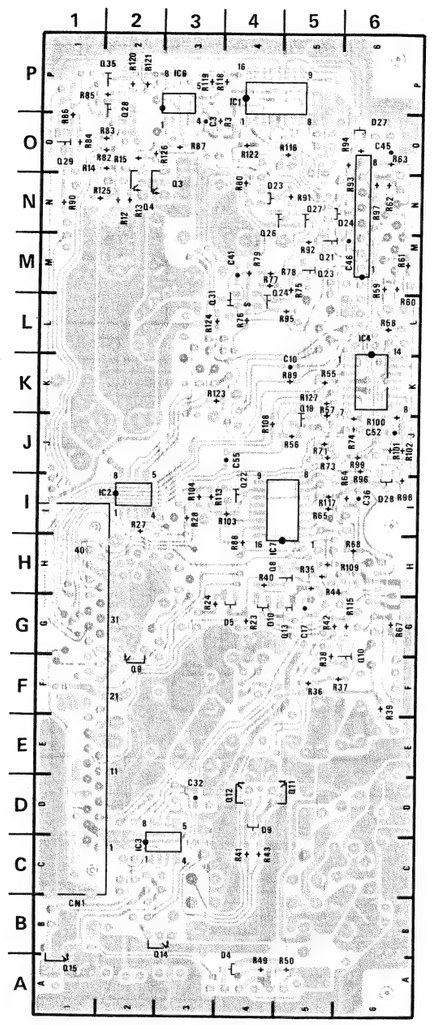
Ser No.10221-11060 (UC)
30356-31100 (J)
40386-41075 (EK)

PS-224 (1-634-133-11)

CN1	I - 1
D2	K - 4
D3	N - 3
D4	A - 4
D5	G - 4
D6	G - 3
D7	J - 1
D9	D - 4
D10	G - 4
D11	E - 5
D12	E - 5
D13	E - 6
D14	E - 6
D15	B - 6
D16	D - 6
D17	C - 5
D18	C - 6
D19	B - 1
D20	B - 2
D21	L - 6
D22	H - 6
D23	N - 4
D24	N - 6
D26	M - 6
D27	O - 6
D28	I - 6
D31	G - 6
E1	G - 3
IC1	P - 4
IC2	I - 2
IC3	C - 2
IC4	L - 6
IC5	O - 6
IC6	P - 3
IC7	H - 4
Q3	O - 2
Q4	O - 2
Q8	H - 4
Q9	F - 2
Q10	F - 6
Q11	D - 5
Q12	D - 4
Q13	G - 5
Q14	B - 2
Q15	A - 1
Q21	M - 5
Q22	I - 4
Q23	M - 5
Q24	L - 4
Q26	N - 4
Q27	N - 5
Q28	P - 2
Q29	O - 1
Q31	L - 3
Q35	P - 2
Q36	P - 2
Q37	O - 3
Q38	O - 3
Q39	P - 3
Q42	O - 4
Q43	P - 4
Q44	O - 5
Q45	P - 5
RV1	K - 3
RV2	K - 5
RV3	H - 3
RV4	M - 6
RV5	N - 6
RV6	P - 5
RV7	O - 4
S1	O - 6
S2	M - 1
T1	A - 4
TP1	K - 4
TP2	J - 3
TP3	I - 3
TP4	G - 2
TP5	B - 1
TP6	B - 2
TP7	N - 3



1-634-133-11 SOLDERING SIDE



1-634-133-11 SOLDERING SIDE

PS-224 (1-634-133-11)

CN1	I - 1
D2	K - 4
D3	N - 3
D4	A - 4
D5	G - 4
D6	G - 3
D7	J - 1
D9	D - 4
D10	G - 4
D11	E - 5
D12	E - 5
D13	E - 6
D14	E - 6
D15	B - 6
D16	D - 6
D17	C - 5
D18	C - 6
D19	B - 1
D20	B - 2
D21	L - 6
D22	H - 6
D23	N - 4
D24	N - 6
D26	M - 6
D27	O - 6
D28	I - 6
D31	G - 6
E1	G - 3
IC1	P - 4
IC2	I - 2
IC3	C - 2
IC4	L - 6
IC5	O - 6
IC6	P - 3
IC7	H - 4
Q3	O - 2
Q4	O - 2
Q8	H - 4
Q9	F - 2
Q10	F - 6
Q11	D - 5
Q12	D - 4
Q13	G - 5
Q14	B - 2
Q15	A - 1
Q21	M - 5
Q22	I - 4
Q23	M - 5
Q24	L - 4
Q26	N - 4
Q27	N - 5
Q28	P - 2
Q29	O - 1
Q31	L - 3
Q35	P - 2
Q36	P - 2
Q37	O - 3
Q38	O - 3
Q39	P - 3
Q42	O - 4
Q43	P - 4
Q44	O - 5
Q45	P - 5
RV1	K - 3
RV2	K - 5
RV3	H - 3
RV4	M - 6
RV5	N - 6
RV6	P - 5
RV7	O - 4
S1	O - 6
S2	M - 1
T1	A - 4
TP1	K - 4
TP2	J - 3
TP3	I - 3
TP4	G - 2
TP5	B - 1
TP6	B - 2
TP7	N - 3

PS-2

PS-224 (

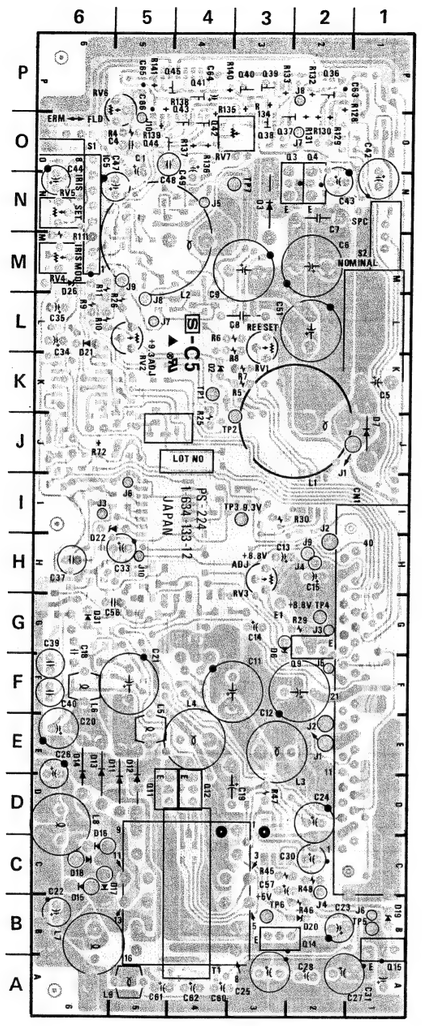
CN1	I
D2	I
D3	I
D4	A
D5	G
D6	G
D7	J
D9	D
D10	G
D11	I
D12	I
D13	I
D14	I
D15	I
D16	I
D17	C
D18	C
D19	I
D20	I
D21	I
D22	I
D23	I
D24	I
D26	I
D27	C
D28	I
D31	G
E1	G
IC1	P
IC2	I
IC3	C
IC4	L
IC5	O
IC6	P
IC7	H
Q3	O
Q4	O
Q8	H
Q9	F
Q10	F
Q11	D
Q12	D
Q13	G
Q14	B
Q15	A
Q21	M
Q22	I
Q23	M
Q24	L
Q26	N
Q27	N
Q28	P
Q29	O
Q31	L
Q35	P
Q36	P
Q37	O
Q38	O
Q39	P
Q42	O
Q43	P
Q44	O
Q45	P
RV1	K
RV2	K
RV3	H
RV4	M
RV5	N
RV6	P
RV7	O
S1	O
S2	M
TP1	K
TP2	J
TP3	I
TP4	G
TP5	B
TP6	B
TP7	N
T1	A

PS-224 BOARD

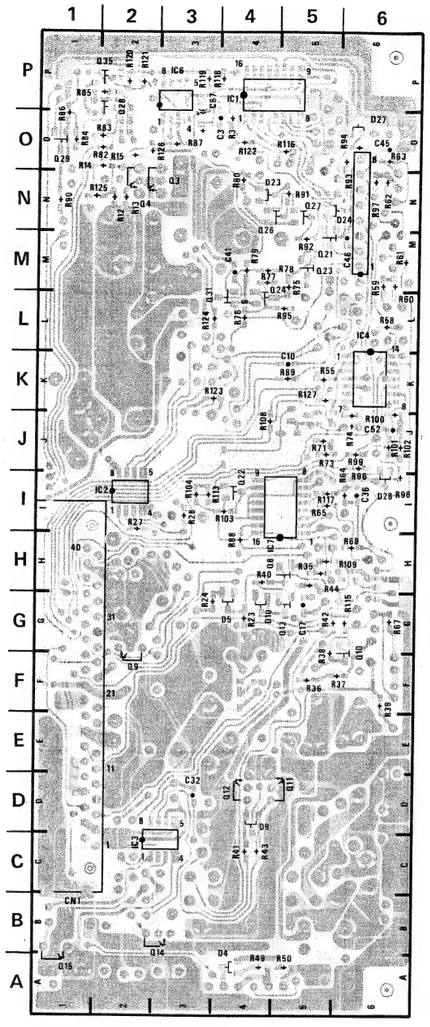
Ser No.11061- (UC)
31101- (J)
41076- (EK)

PS-224 (1-634-133-12)

CN1	I - 1
D2	K - 4
D3	N - 3
D4	A - 4
D5	G - 4
D6	G - 3
D7	J - 1
D9	D - 4
D10	G - 4
D11	E - 5
D12	E - 5
D13	E - 6
D14	E - 6
D15	B - 6
D16	D - 6
D17	C - 5
D18	C - 6
D19	B - 1
D20	B - 2
D21	L - 6
D22	H - 6
D23	N - 4
D24	N - 6
D26	M - 6
D27	O - 6
D28	I - 6
D31	G - 6
E1	G - 3
IC1	P - 4
IC2	I - 2
IC3	C - 2
IC4	L - 6
IC5	O - 6
IC6	P - 3
IC7	H - 4
Q3	O - 2
Q4	O - 2
Q8	H - 4
Q9	F - 2
Q10	F - 6
Q11	D - 5
Q12	D - 4
Q13	G - 5
Q14	B - 2
Q15	A - 1
Q21	M - 5
Q22	I - 4
Q23	M - 5
Q24	L - 4
Q26	N - 4
Q27	N - 5
Q28	P - 2
Q29	O - 1
Q31	L - 3
Q35	P - 2
Q36	P - 2
Q37	O - 3
Q38	O - 3
Q39	P - 3
Q42	O - 4
Q43	P - 4
Q44	O - 5
Q45	P - 5
RV1	K - 3
RV2	K - 5
RV3	H - 3
RV4	M - 6
RV5	N - 6
RV6	P - 5
RV7	O - 4
S1	O - 6
S2	M - 1
TP1	K - 4
TP2	J - 3
TP3	I - 3
TP4	G - 2
TP5	B - 1
TP6	B - 2
TP7	N - 3
T1	A - 4



1-634-133-12 SOLDERING SIDE

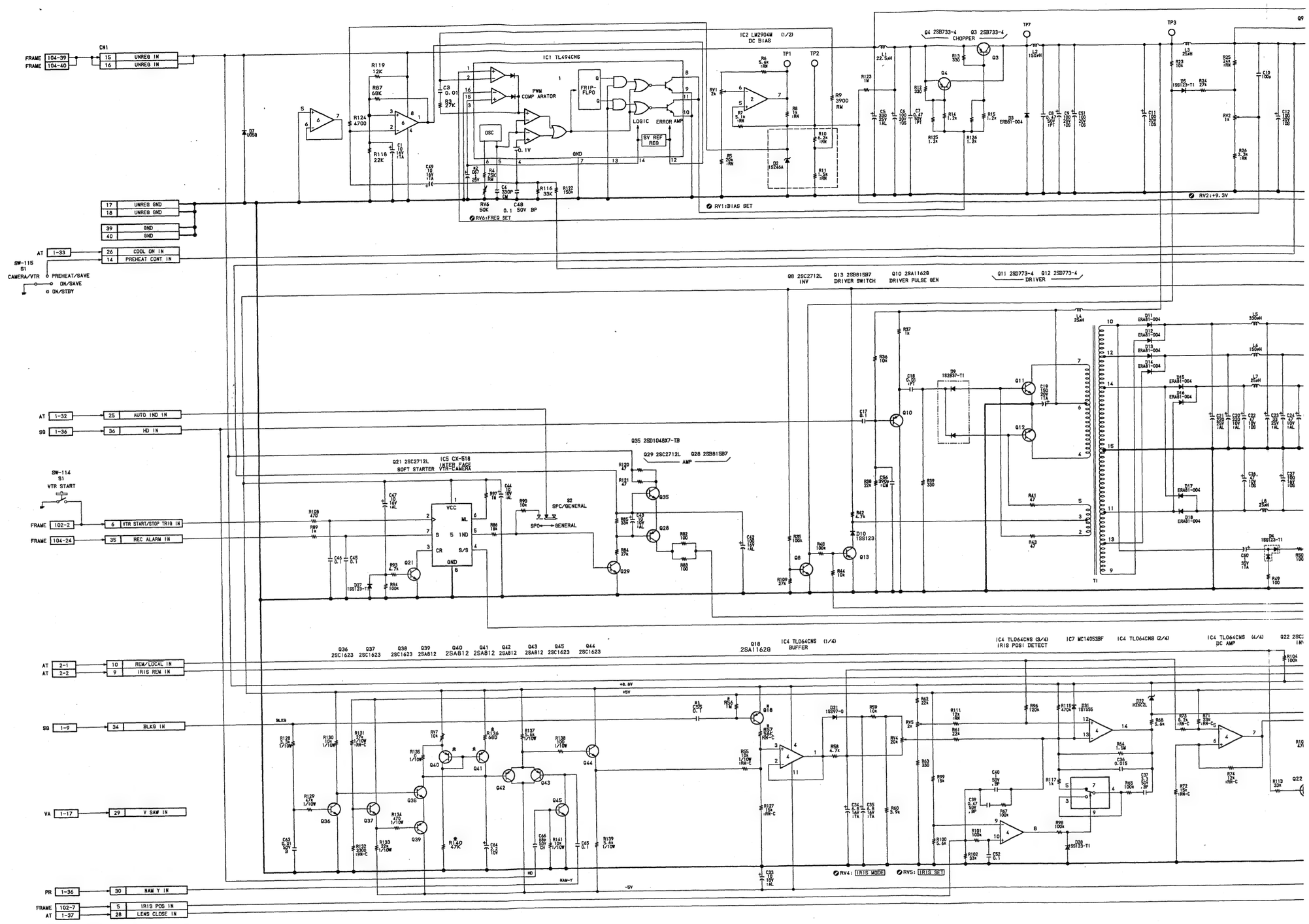


1-634-133-12 SOLDERING SIDE

PS-224 (1-634-133-12)

CN1	I - 1
D2	K - 4
D3	N - 3
D4	A - 4
D5	G - 4
D6	G - 3
D7	J - 1
D9	D - 4
D10	G - 4
D11	E - 5
D12	E - 5
D13	E - 6
D14	E - 6
D15	B - 6
D16	D - 6
D17	C - 5
D18	C - 6
D19	B - 1
D20	B - 2
D21	L - 6
D22	H - 6
D23	N - 4
D24	N - 6
D26	M - 6
D27	O - 6
D28	I - 6
D31	G - 6
E1	G - 3
IC1	P - 4
IC2	I - 2
IC3	C - 2
IC4	L - 6
IC5	O - 6
IC6	P - 3
IC7	H - 4
Q3	O - 2
Q4	O - 2
Q8	H - 4
Q9	F - 2
Q10	F - 6
Q11	D - 5
Q12	D - 4
Q13	G - 5
Q14	B - 2
Q15	A - 1
Q21	M - 5
Q22	I - 4
Q23	M - 5
Q24	L - 4
Q26	N - 4
Q27	N - 5
Q28	P - 2
Q29	O - 1
Q31	L - 3
Q35	P - 2
Q36	P - 2
Q37	O - 3
Q38	O - 3
Q39	P - 3
Q42	O - 4
Q43	P - 4
Q44	O - 5
Q45	P - 5
RV1	K - 3
RV2	K - 5
RV3	H - 3
RV4	M - 6
RV5	N - 6
RV6	P - 5
RV7	O - 4
S1	O - 6
S2	M - 1
TP1	K - 4
TP2	J - 3
TP3	I - 3
TP4	G - 2
TP5	B - 1
TP6	B - 2
TP7	N - 3
T1	A - 4

PS-224 BOARD
DC-DC CONVERTER
IRIS CONTROL
VTR-CAMERA INTERFACE

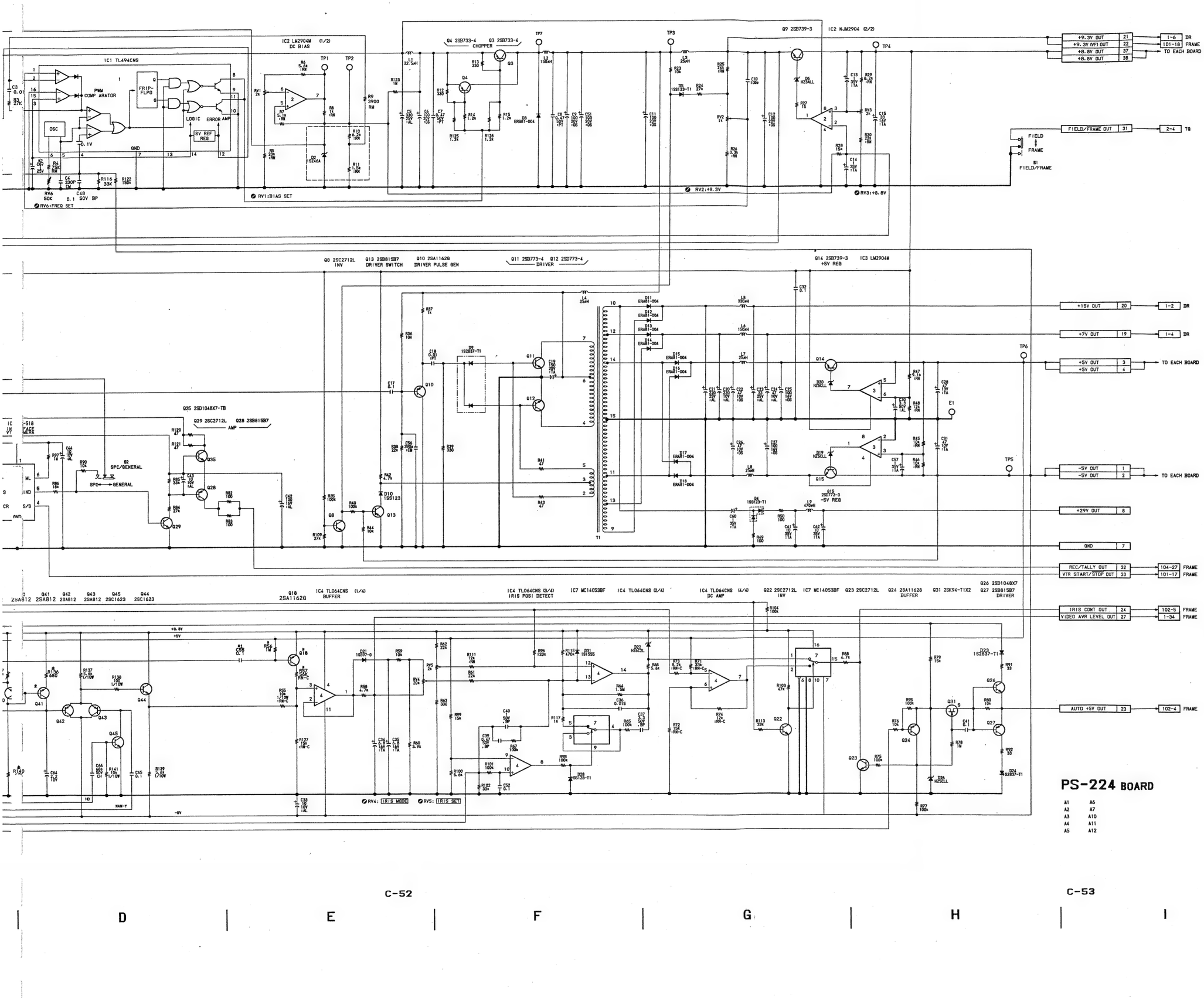


BVP-70 (J, UC)
BVP-70P (EK)

C-51 C-52

A | B | C | D | E | F | G

PS-224



NOTE MARK	CHANGE INFORMATION	SERIAL NO.
*	R56 1H, R57 56K, Q18 2SA1162G } DELETE	10274- (UC) 30421- (J) 40432- (EK)
※1	C55 0.1u → DELETE	10334- (UC) 30471- (J) 40522- (EK)
※2	C67 1u → ADD	11061- (UC) 31101- (J) 41076- (EK)

PS-224 BOARD

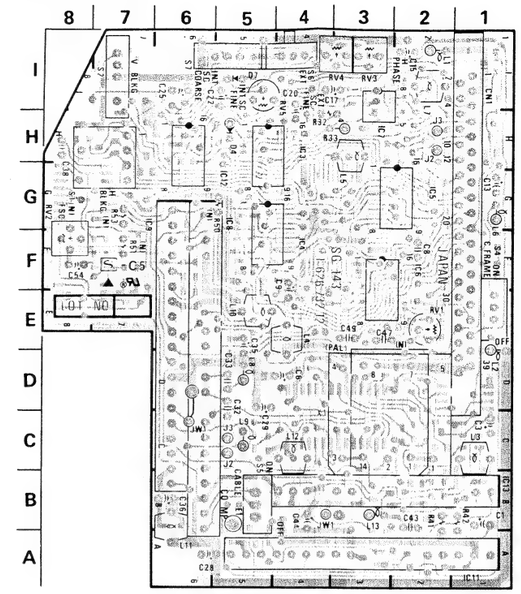
A1	A6
A2	A7
A3	A10
A4	A11
A5	A12

SG-143/143AP BOARD

Ser No.10221-11186 (UC)
30356-31215 (J)
40386-41262 (EK)

SG-143/143AP (1-626-732-12)

CN1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
D3	G - 2	Q5	H - 5
D4	H - 5	Q6	H - 3
D5	E - 2	Q7	A - 3
D6	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
D9	H - 7	RV1	E - 2
D10	F - 5	RV2	G - 8
		RV3	I - 3
E1	B - 5	RV4	I - 3
		RV5	I - 4
IC1	C - 2		
IC2	F - 3	S1	G - 8
IC3	H - 4	S2	I - 7
IC4	F - 4	S4	F - 1
IC5	G - 2	S5	C - 5
IC6	F - 2	S6	I - 4
IC7	H - 3	S7	I - 6
IC8	G - 5		
IC9	G - 7	X1	C - 4
IC10	G - 8		
IC11	A - 1		
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (AP)		



1-626-732-12 SOLDERING SIDE

C-54 (a)

C-55 (a)

B-BVP70-SG143/MOUNT

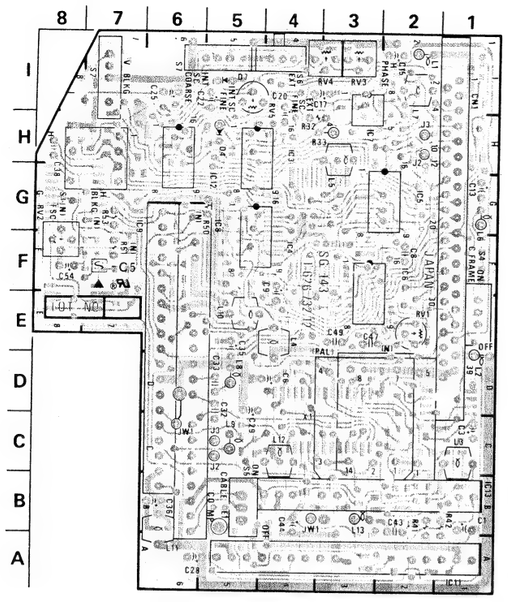
A | B | C | D | E | F | G

S -143/143AP BOARD

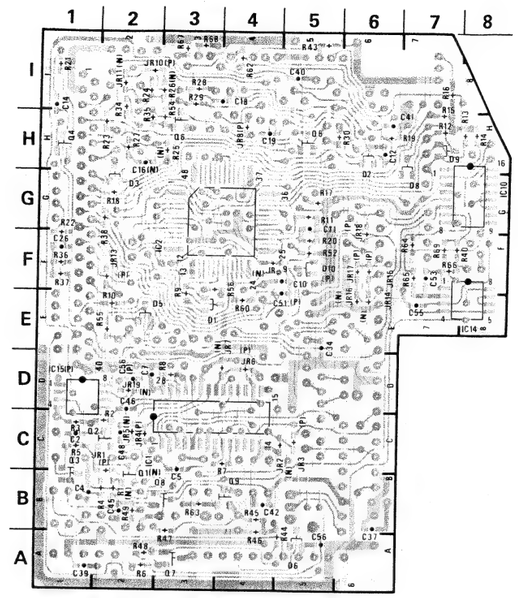
Ser No.10221-11186 (UC)
30356-31215 (J)
40386-41262 (EK)

SG-143/143AP (1-626-732-12)

N1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
	G - 2	Q5	H - 5
	H - 5	Q6	H - 3
	E - 2	Q7	A - 3
	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
	H - 7	RV1	E - 2
0	F - 5	RV2	G - 8
		RV3	I - 3
	B - 5	RV4	I - 3
		RV5	I - 4
IC1	C - 2		
	F - 3	S1	G - 8
	H - 4	S2	I - 7
	F - 4	S4	F - 1
	G - 2	S5	C - 5
IC6	F - 2	S6	I - 4
IC7	H - 3	S7	I - 6
	G - 5		
	G - 7	X1	C - 4
0	G - 8		
1	A - 1		
IC12	G - 5		
IC13	B - 1		
4	E - 8		
5	D - 1 (AP)		



1-626-732-12 SOLDERING SIDE



1-626-732-12 SOLDERING SIDE

SG-143/143AP (1-626-732-12)

CN1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
D3	G - 2	Q5	H - 5
D4	H - 5	Q6	H - 3
D5	E - 2	Q7	A - 3
D6	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
D9	H - 7	RV1	E - 2
D10	F - 5	RV2	G - 8
		RV3	I - 3
E1	B - 5	RV4	I - 3
		RV5	I - 4
IC1	C - 2		
IC2	F - 3	S1	G - 8
IC3	H - 4	S2	I - 7
IC4	F - 4	S4	F - 1
IC5	G - 2	S5	C - 5
IC6	F - 2	S6	I - 4
IC7	H - 3	S7	I - 6
IC8	G - 5		
IC9	G - 7	X1	C - 4
IC10	G - 8		
IC11	A - 1		
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (AP)		

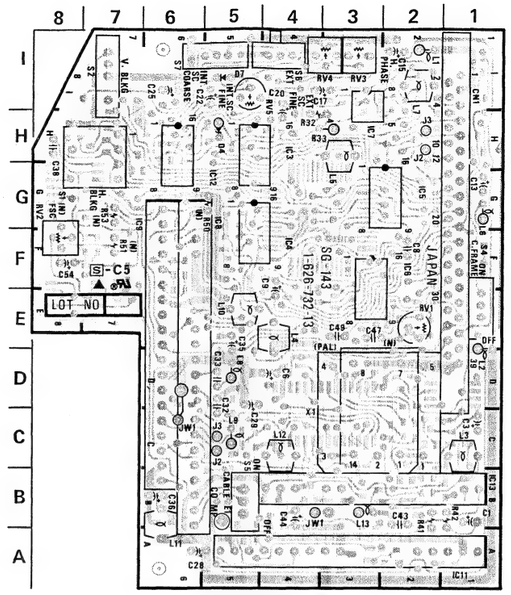
SG-143/143AP SG-143/

SG-143/143AP BOARD

Ser No.	
11187-	(UC)
31216-	(J)
41263-	(EK)

SG-143/143AP (1-626-732-13)

CN1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
D3	G - 2	Q5	H - 5
D4	H - 5	Q6	H - 3
D5	E - 2	Q7	A - 3
D6	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
D9	H - 7	RV1	E - 2
D10	F - 5 (AP)	RV2	G - 8
		RV3	I - 3
IC1	C - 2	RV4	I - 3
IC2	F - 3	RV5	I - 4
IC3	H - 4		
IC4	F - 4	S1	G - 8
IC5	G - 2	S2	I - 7
IC6	F - 2	S4	F - 1
IC7	H - 3	S5	C - 5
IC8	G - 5	S6	I - 4
IC9	G - 7	S7	I - 6
IC10	G - 8		
IC11	A - 1	X1	C - 4
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (AP)		



1-626-732-13 SOLDERING SIDE

B-BVP70-SG143/MOUNT

C-54 (b)

C-55 (b)

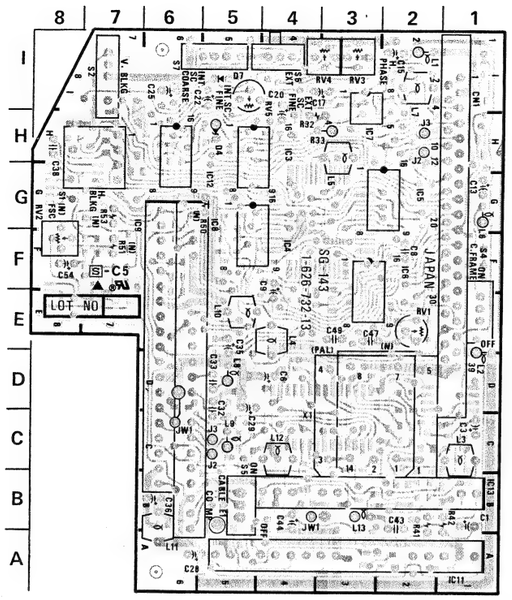
A | B | C | D | E | F | G

SG-143/143AP BOARD

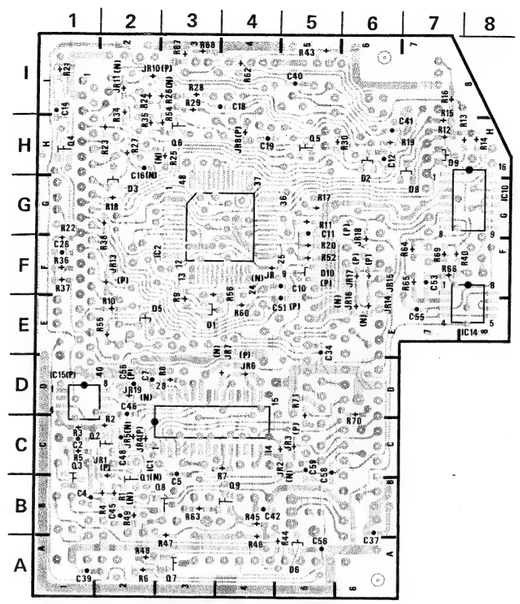
Ser No.11187- (UC)
31216- (J)
41263- (EK)

SG-143/143AP (1-626-732-13)

CN1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
D3	G - 2	Q5	H - 5
D4	H - 5	Q6	H - 3
D5	E - 2	Q7	A - 3
D6	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
D9	H - 7	RV1	E - 2
D10	F - 5 (AP)	RV2	G - 8
		RV3	I - 3
IC1	C - 2	RV4	I - 3
IC2	F - 3	RV5	I - 4
IC3	H - 4		
IC4	F - 4	S1	G - 8
IC5	G - 2	S2	I - 7
IC6	F - 2	S4	F - 1
IC7	H - 3	S5	C - 5
IC8	G - 5	S6	I - 4
IC9	G - 7	S7	I - 6
IC10	G - 8		
IC11	A - 1	X1	C - 4
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (AP)		



1-626-732-13 SOLDERING SIDE

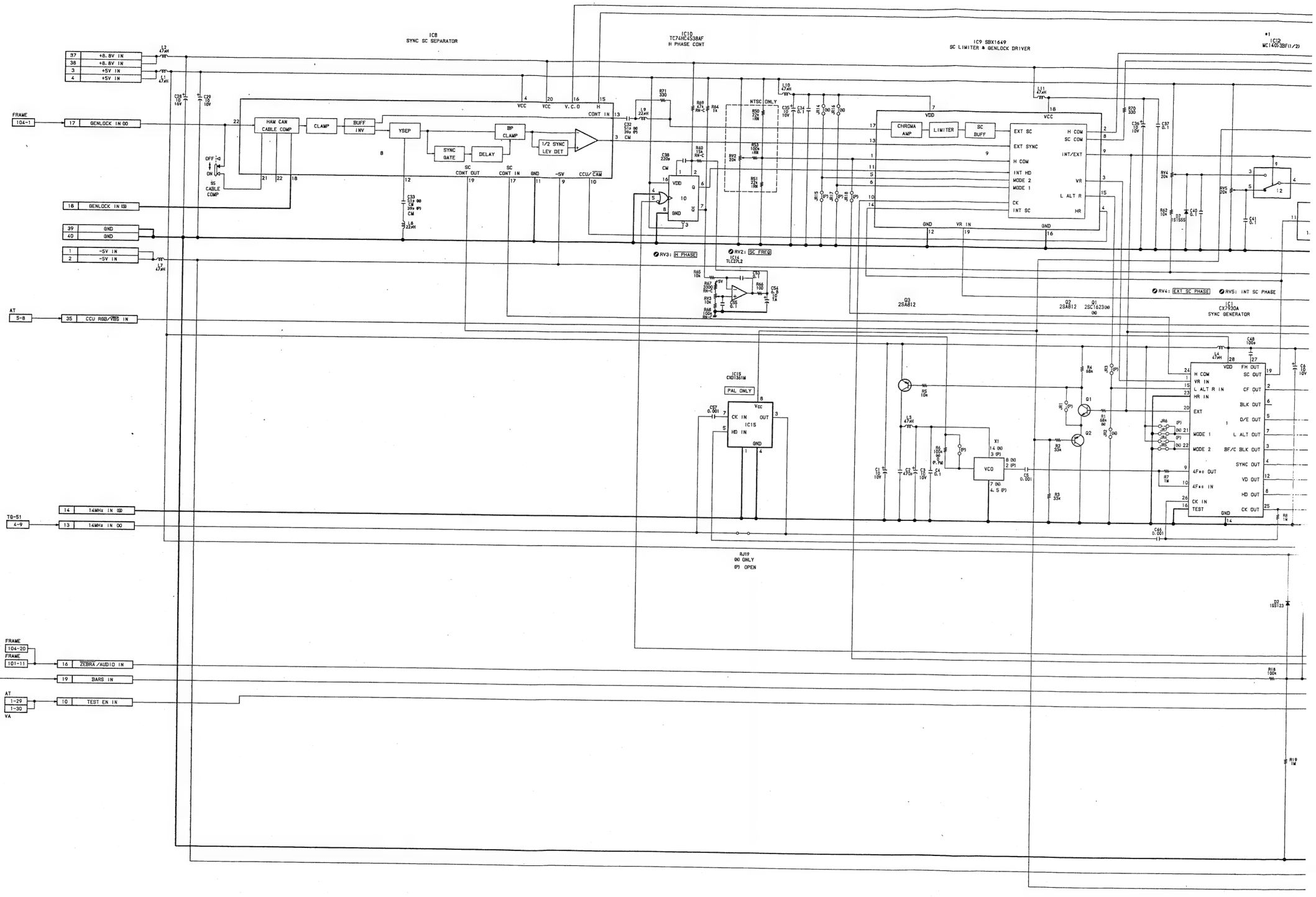


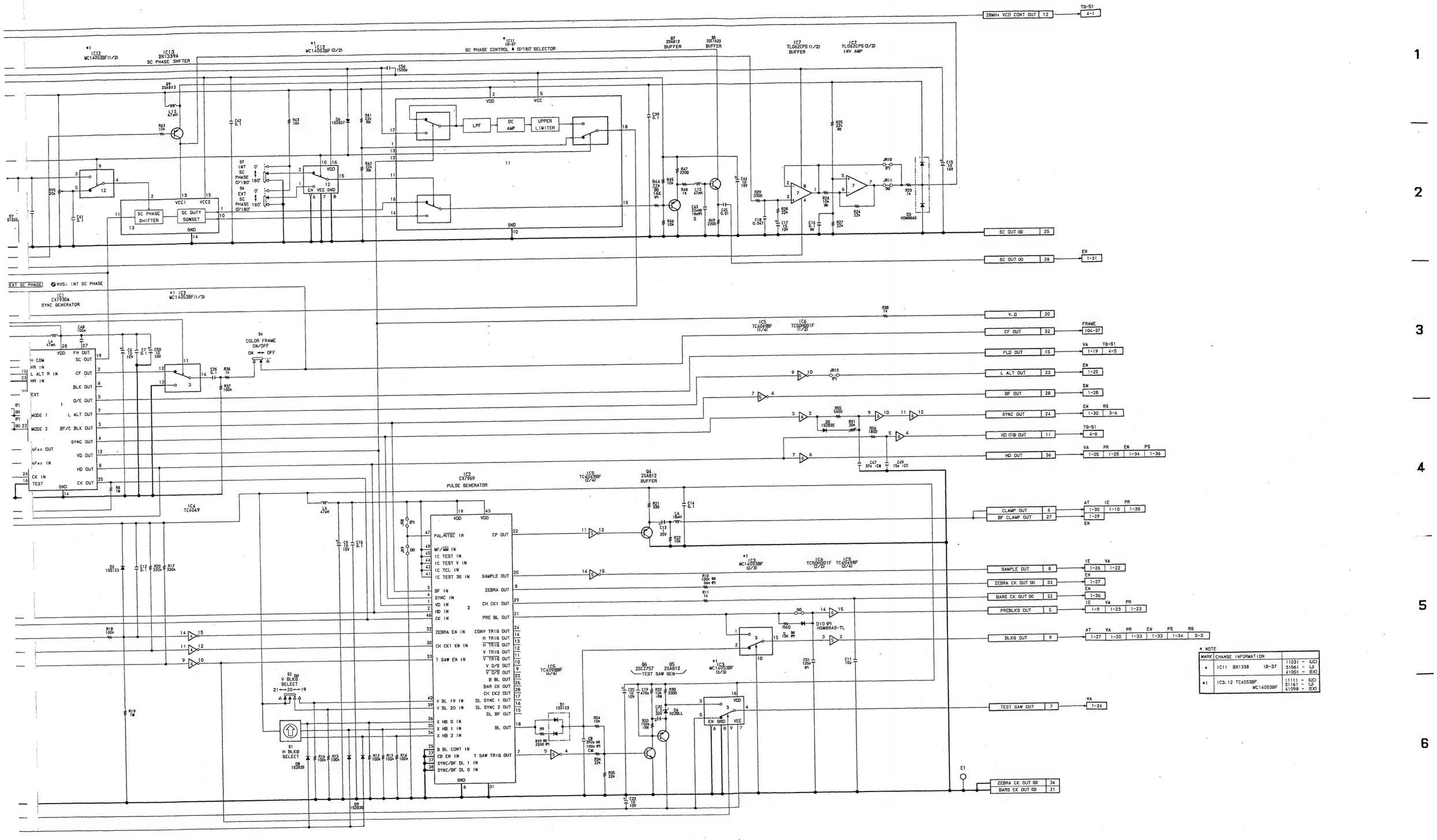
1-626-732-13 SOLDERING SIDE

SG-143/143AP (1-626-732-13)

CN1	I - 1	Q1	B - 2
		Q2	C - 2
D1	E - 3	Q3	C - 1
D2	G - 6	Q4	H - 1
D3	G - 2	Q5	H - 5
D4	H - 5	Q6	H - 3
D5	E - 2	Q7	A - 3
D6	A - 5	Q8	B - 3
D7	I - 5	Q9	B - 4
D8	G - 7		
D9	H - 7	RV1	E - 2
D10	F - 5 (AP)	RV2	G - 8
		RV3	I - 3
IC1	C - 2	RV4	I - 3
IC2	F - 3	RV5	I - 4
IC3	H - 4		
IC4	F - 4	S1	G - 8
IC5	G - 2	S2	I - 7
IC6	F - 2	S4	F - 1
IC7	H - 3	S5	C - 5
IC8	G - 5	S6	I - 4
IC9	G - 7	S7	I - 6
IC10	G - 8		
IC11	A - 1	X1	C - 4
IC12	G - 5		
IC13	B - 1		
IC14	E - 8		
IC15	D - 1 (AP)		

SG-143/143AP BOARD
SYNC GENERATOR
TIMING PULS GENERATER
C PHASE CONTROL





* NOTE

MARK	CHANGE INFORMATION		
▲	IC11 BX1338	IB-37	11031 - (UC) 31061 - (J) 41001 - (EK)
●1	IC3, 12 TC4053BF MC14053BF		11111 - (UC) 31161 - (J) 41098 - (EK)

C-59 C-60

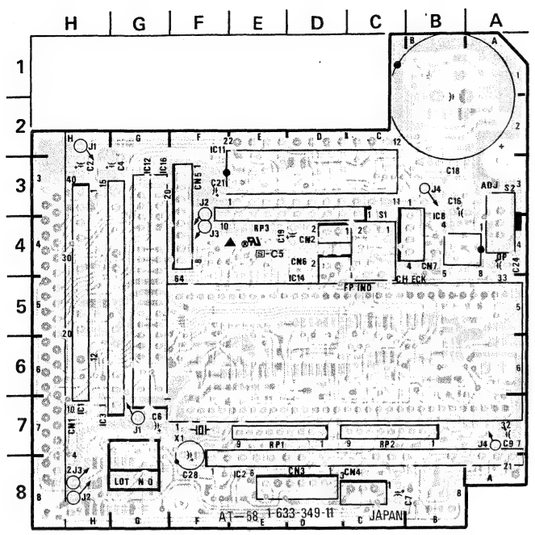
B-BVP70-SG143M

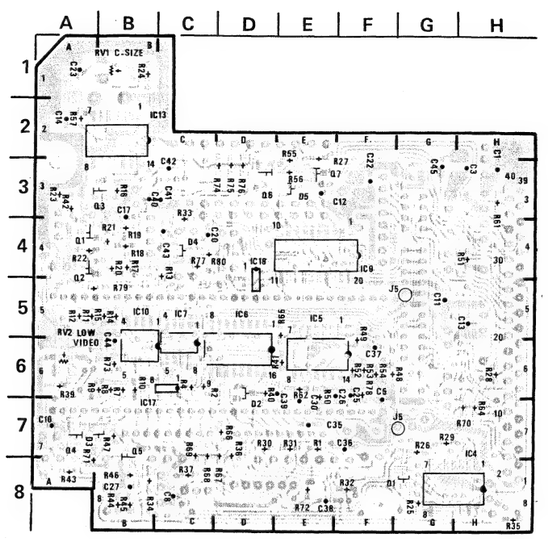
AT-58 BOARD

Ser No.10221-11060 (UC)
30356-31100 (J)
40386-41075 (EK)

AT-58 (1-633-349-11)

CN1	H - 7
CN2	D - 4
CN3	D - 8
CN4	C - 8
CN5	F - 3
CN6	D - 4
CN7	B - 4
D1	G - 8
D2	D - 7
D3	A - 7
D4	C - 4
D5	E - 3
IC1	H - 7
IC2	E - 8
IC3	H - 7
IC4	H - 7
IC5	E - 5
IC6	D - 5
IC7	C - 5
IC8	B - 4
IC9	F - 4
IC10	B - 5
IC11	F - 2
IC12	G - 3
IC13	B - 2
IC14	D - 5
IC15	D - 5
IC16	G - 3
IC17	B - 7
IC18	D - 4
Q1	A - 4
Q2	A - 4
Q3	B - 3
Q4	A - 7
Q5	B - 7
Q6	D - 3
Q7	E - 3
RP1	E - 7
RP2	C - 7
RP3	E - 4
RV1	B - 1
RV2	A - 5
S1	C - 4
S2	A - 3
X1	F - 7





AT-58 (1-633-349-11)

CN1	H - 7
CN2	D - 4
CN3	D - 8
CN4	C - 8
CN5	F - 3
CN6	D - 4
CN7	B - 4
D1	G - 8
D2	D - 7
D3	A - 7
D4	C - 4
D5	E - 3
IC1	H - 7
IC2	E - 8
IC3	H - 7
IC4	H - 7
IC5	E - 5
IC6	D - 5
IC7	C - 5
IC8	B - 4
IC9	F - 4
IC10	B - 5
IC11	F - 2
IC12	G - 3
IC13	B - 2
IC14	D - 5
IC15	D - 5
IC16	G - 3
IC17	B - 7
IC18	D - 4
Q1	A - 4
Q2	A - 4
Q3	B - 3
Q4	A - 7
Q5	B - 7
Q6	D - 3
Q7	E - 3
RP1	E - 7
RP2	C - 7
RP3	E - 4
RV1	B - 1
RV2	A - 5
S1	C - 4
S2	A - 3
X1	F - 7

AT-5

AT-58 (1

CN1
CN2
CN3
CN4
CN5
CN6
CN7

D1
D2
D3
D4
D5

IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18

Q1
Q2
Q3
Q4
Q5
Q6
Q7

RP1
RP2
RP3

RV1
RV2

S1
S2

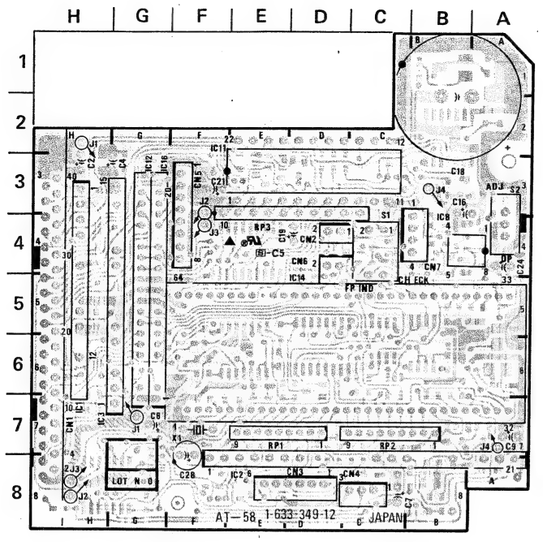
X1

AT-58 BOARD

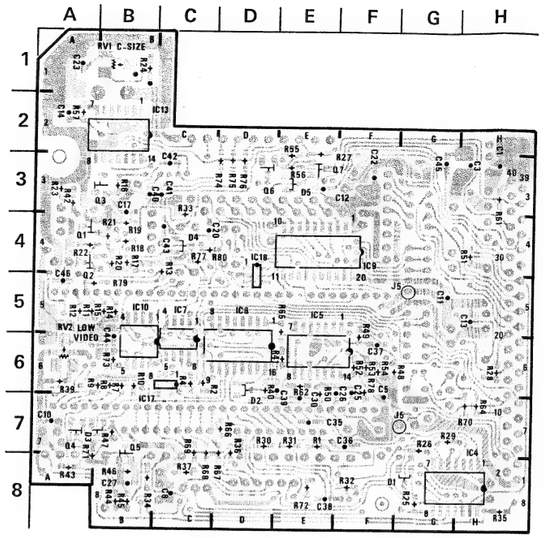
Ser No.11061-11186 (UC)
31101-31215 (J)
41076-41262 (EK)

AT-58 (1-633-349-12)

CN1	H - 7
CN2	D - 4
CN3	D - 8
CN4	C - 8
CN5	F - 3
CN6	D - 4
CN7	B - 4
D1	F - 8
D2	D - 7
D3	A - 7
D4	C - 4
D5	E - 3
IC1	H - 7
IC2	E - 8
IC3	H - 7
IC4	H - 7
IC5	E - 5
IC6	D - 5
IC7	C - 5
IC8	B - 4
IC9	F - 4
IC10	B - 5
IC11	F - 2
IC12	G - 3
IC13	B - 2
IC14	D - 5
IC15	D - 5
IC16	G - 3
IC17	B - 7
IC18	D - 4
Q1	A - 4
Q2	A - 4
Q3	B - 3
Q4	A - 7
Q5	B - 7
Q6	D - 3
Q7	E - 3
RP1	E - 7
RP2	C - 7
RP3	E - 4
RV1	B - 1
RV2	A - 5
S1	C - 4
S2	A - 3
X1	F - 7



1-633-349-12 SOLDERING SIDE



1-633-349-12 SOLDERING SIDE

AT-58 (1-633-349-12)

CN1	H - 7
CN2	D - 4
CN3	D - 8
CN4	C - 8
CN5	F - 3
CN6	D - 4
CN7	B - 4
D1	F - 8
D2	D - 7
D3	A - 7
D4	C - 4
D5	E - 3
IC1	H - 7
IC2	E - 8
IC3	H - 7
IC4	H - 7
IC5	E - 5
IC6	D - 5
IC7	C - 5
IC8	B - 4
IC9	F - 4
IC10	B - 5
IC11	F - 2
IC12	G - 3
IC13	B - 2
IC14	D - 5
IC15	D - 5
IC16	G - 3
IC17	B - 7
IC18	D - 4
Q1	A - 4
Q2	A - 4
Q3	B - 3
Q4	A - 7
Q5	B - 7
Q6	D - 3
Q7	E - 3
RP1	E - 7
RP2	C - 7
RP3	E - 4
RV1	B - 1
RV2	A - 5
S1	C - 4
S2	A - 3
X1	F - 7

C-63 (a)

C-64 (a)

G H I J K L M

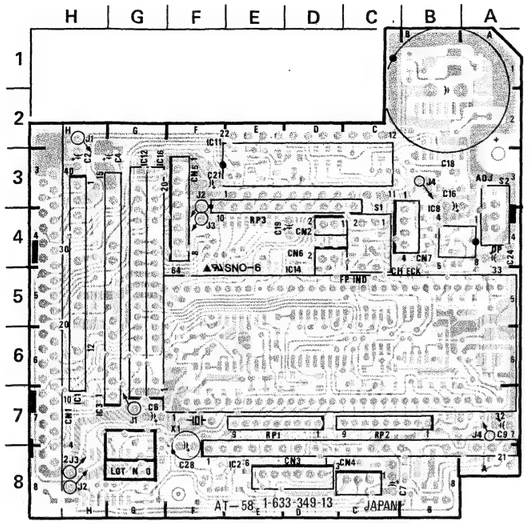
BVP-70 (J, UC)
BVP-70P (EK)

AT-58 BOARD

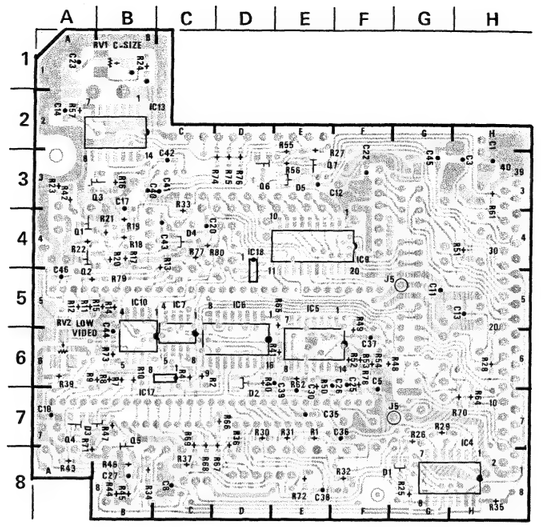
Ser No.11187- (UC)
31216- (J)
41263- (EK)

AT-58 (1-633-349-13)

CN1	H - 7
CN2	D - 4
CN3	D - 8
CN4	C - 8
CN5	F - 3
CN6	D - 4
CN7	B - 4
D1	F - 8
D2	D - 7
D3	A - 7
D4	C - 4
D5	E - 3
IC1	H - 7
IC2	E - 8
IC3	H - 7
IC4	H - 7
IC5	E - 5
IC6	D - 5
IC7	C - 5
IC8	B - 4
IC9	F - 4
IC10	B - 5
IC11	F - 2
IC12	G - 3
IC13	B - 2
IC14	D - 5
IC15	D - 5
IC16	G - 3
IC17	B - 7
IC18	D - 4
Q1	A - 4
Q2	A - 4
Q3	B - 3
Q4	A - 7
Q5	B - 7
Q6	D - 3
Q7	E - 3
RP1	E - 7
RP2	C - 7
RP3	E - 4
RV1	B - 1
RV2	A - 5
S1	C - 4
S2	A - 3
X1	F - 7



1-633-349-13 SOLDERING SIDE

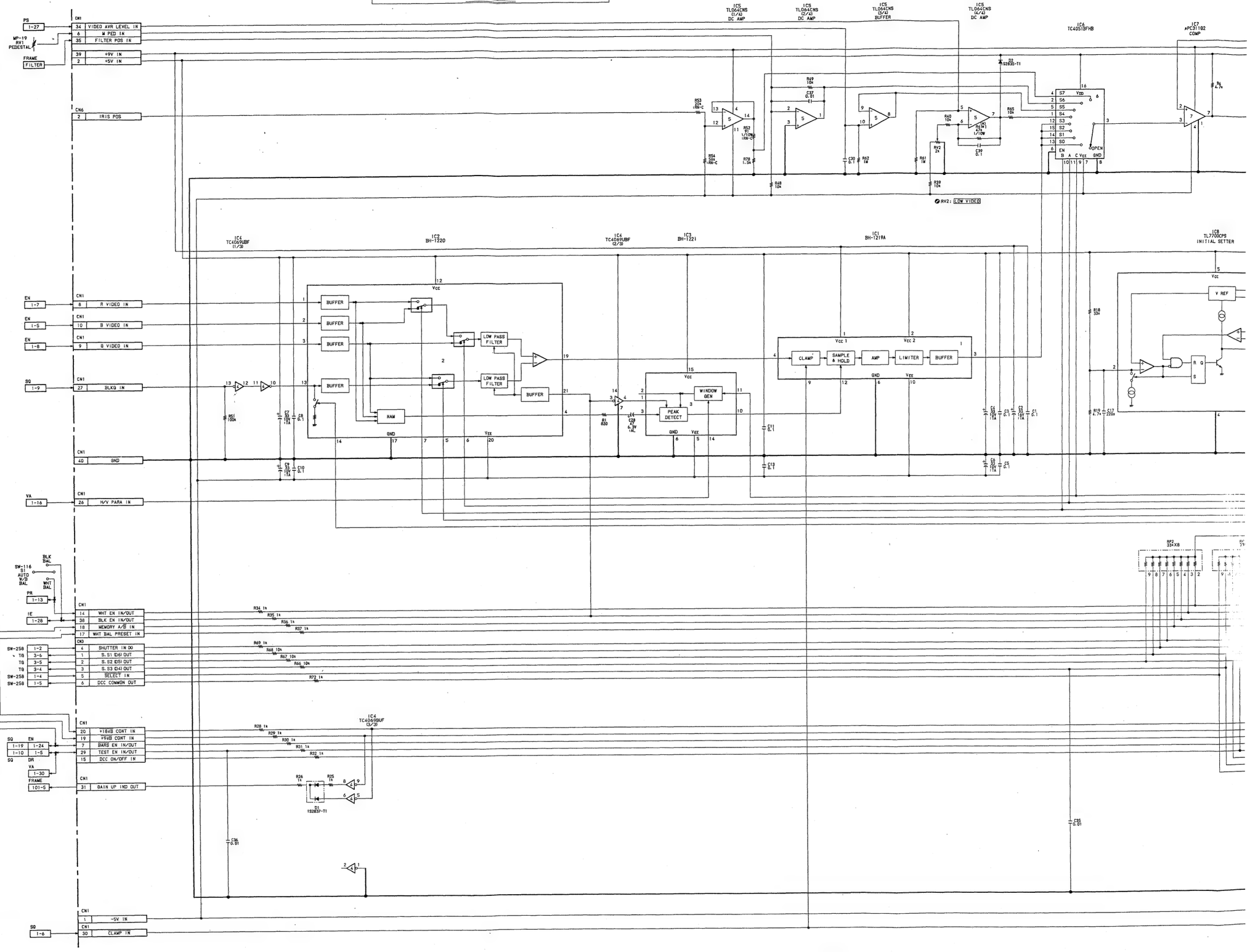


1-633-349-13 SOLDERING SIDE

AT-58 (1-633-349-13)

CN1	H - 7
CN2	D - 4
CN3	D - 8
CN4	C - 8
CN5	F - 3
CN6	D - 4
CN7	B - 4
D1	F - 8
D2	D - 7
D3	A - 7
D4	C - 4
D5	E - 3
IC1	H - 7
IC2	E - 8
IC3	H - 7
IC4	H - 7
IC5	E - 5
IC6	D - 5
IC7	C - 5
IC8	B - 4
IC9	F - 4
IC10	B - 5
IC11	F - 2
IC12	G - 3
IC13	B - 2
IC14	D - 5
IC15	D - 5
IC16	G - 3
IC17	B - 7
IC18	D - 4
Q1	A - 4
Q2	A - 4
Q3	B - 3
Q4	A - 7
Q5	B - 7
Q6	D - 3
Q7	E - 3
RP1	E - 7
RP2	C - 7
RP3	E - 4
RV1	B - 1
RV2	A - 5
S1	C - 4
S2	A - 3
X1	F - 7

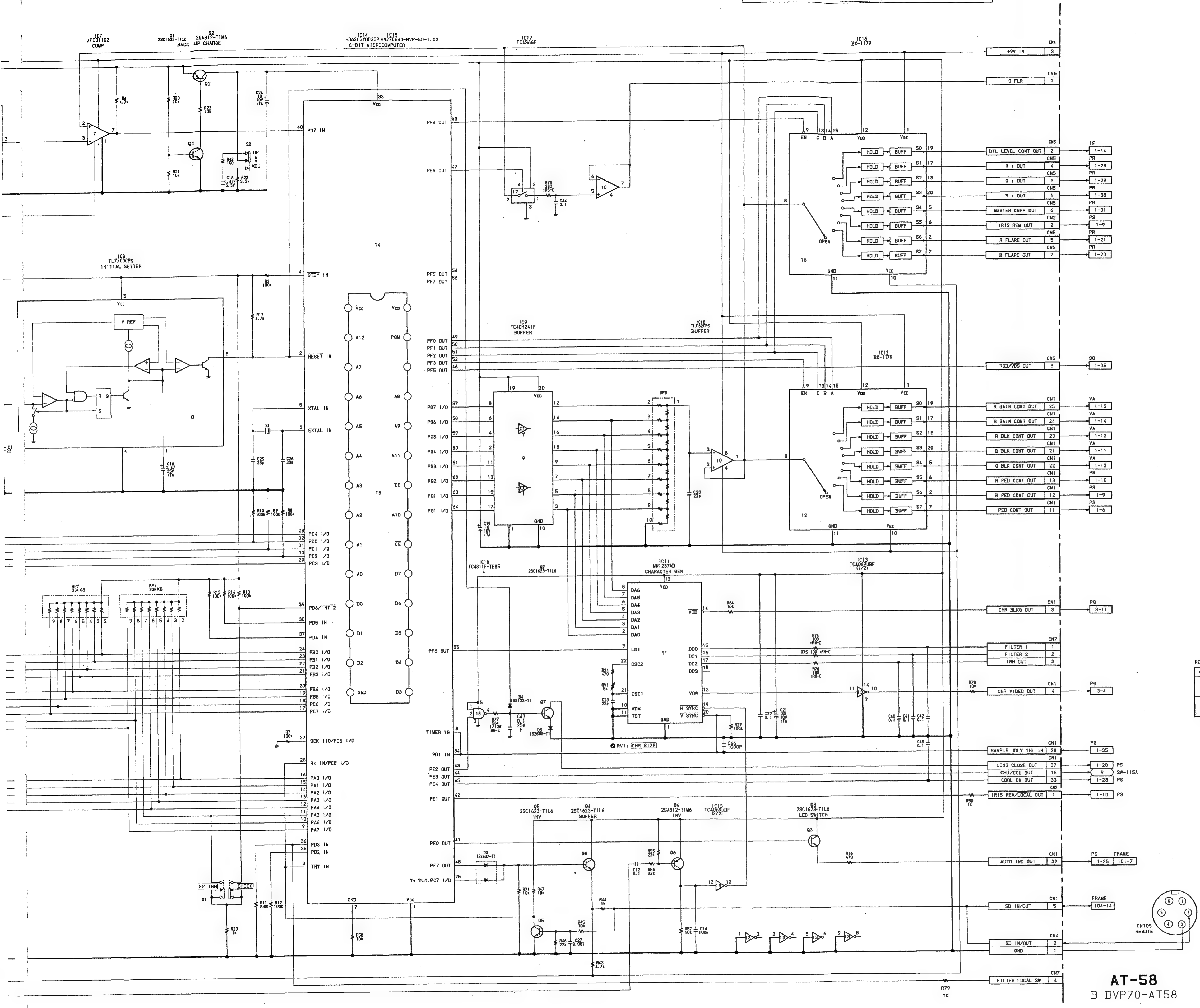
AT-58 BOARD
AUTOMATIC CONTROL SYSTEM



C-65 C-66

BVP-70 (J, UC)
BVP-70P (EK)

A | B | C | D | E | F | G



AT-58
B-BVP70-AT58

NOTE

MARK	CHANGE INFORMATION	SERIAL. NO
*	R41 22K → 27K	11031 - (UC) 31061 - (J)
*1	R41 27K → 47K	11151 - (UC) 31191 - (J) 41168 - (EK)

G | H | I | J | K | L | M

B-BVP70-AT58M

RG-20/20P RG-20/20P

1

2

3

4

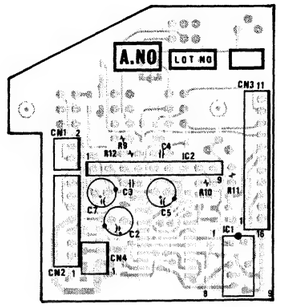
5

C-69 C-70

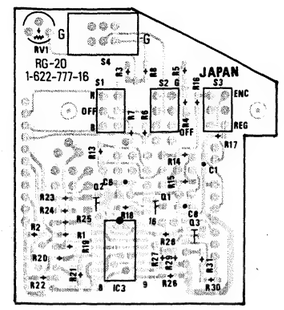
B-BVP70-RG20/MOUNT

A | B | C | D | E | F | G

RG-20/20P BOARD

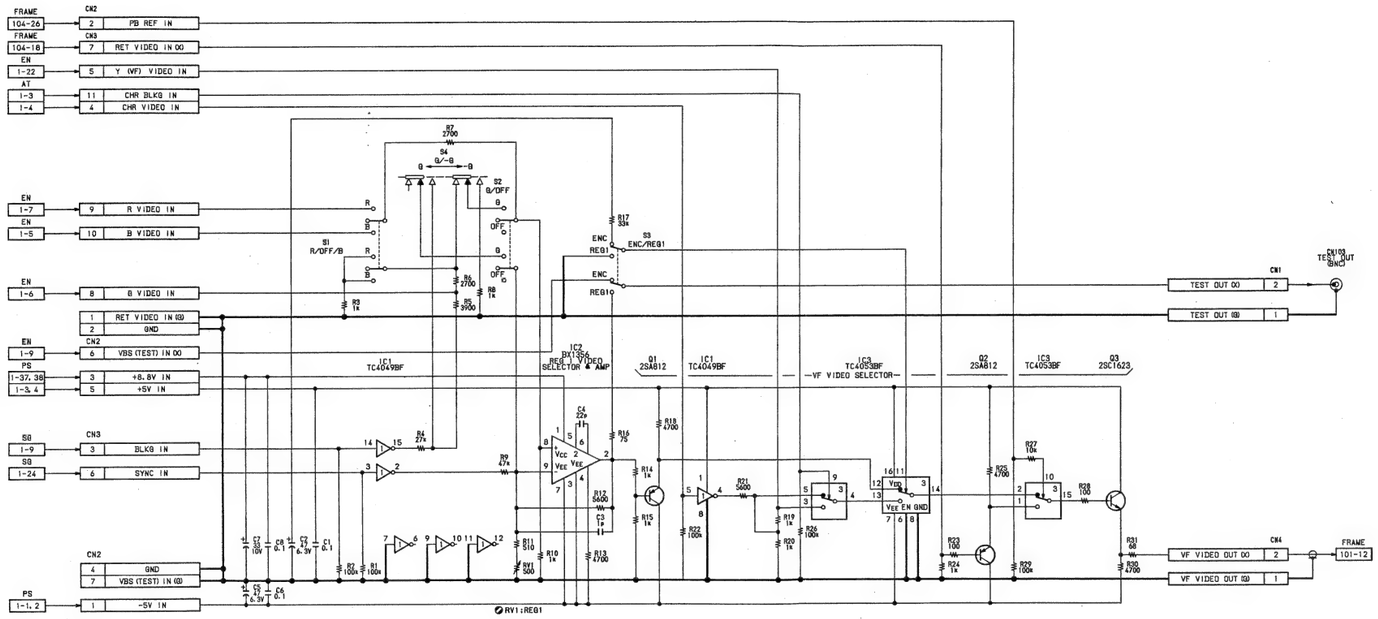


1-622-777-16 SOLDERING SIDE



1-622-777-16 SOLDERING SIDE

RG-20/20P BOARD



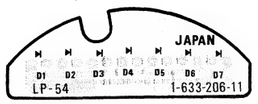
C-73 C-74

B-BVP70-RG20M

A B C D E F

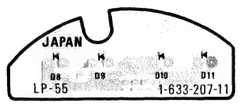
VIEWFINDER
CN-440 LP-54 LP-55 LP-56
SW-425 VF-41 VR-108

LP-54 BOARD



1-633-206-11 SOLDERING SIDE

LP-55 BOARD

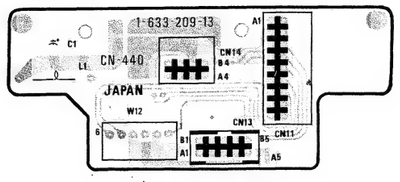


1-633-207-11 SOLDERING SIDE

LP-56 BOARD

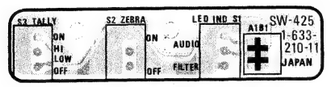
1-633-208-12 SOLDERING SIDE

CN-440 BOARD



1-633-209-13 SOLDERING SIDE

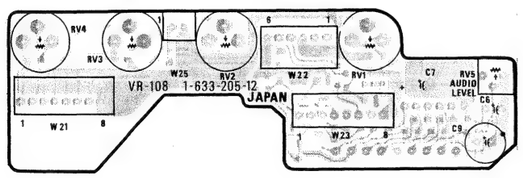
SW-425 BOARD



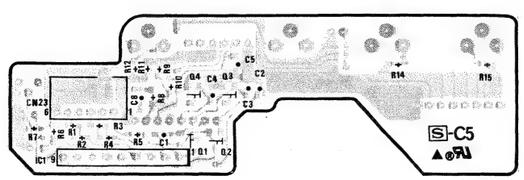
1-633-210-11 SOLDERING SIDE

1-633-210-11 SOLDERING SIDE

VR-108 BOARD

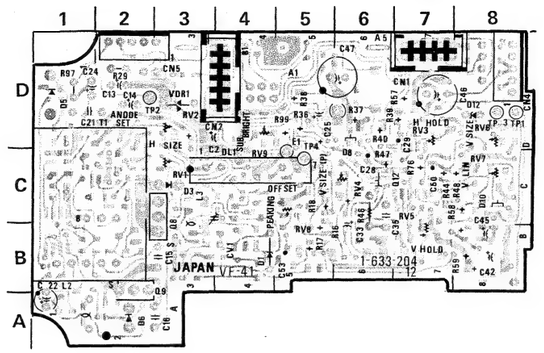


1-633-205-12 SOLDERING SIDE

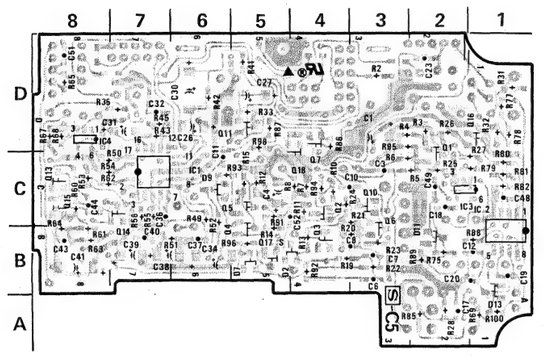


1-633-205-12 SOLDERING SIDE

VF-41 BOARD



1-633-204-12 SOLDERING SIDE



1-633-204-12 SOLDERING SIDE

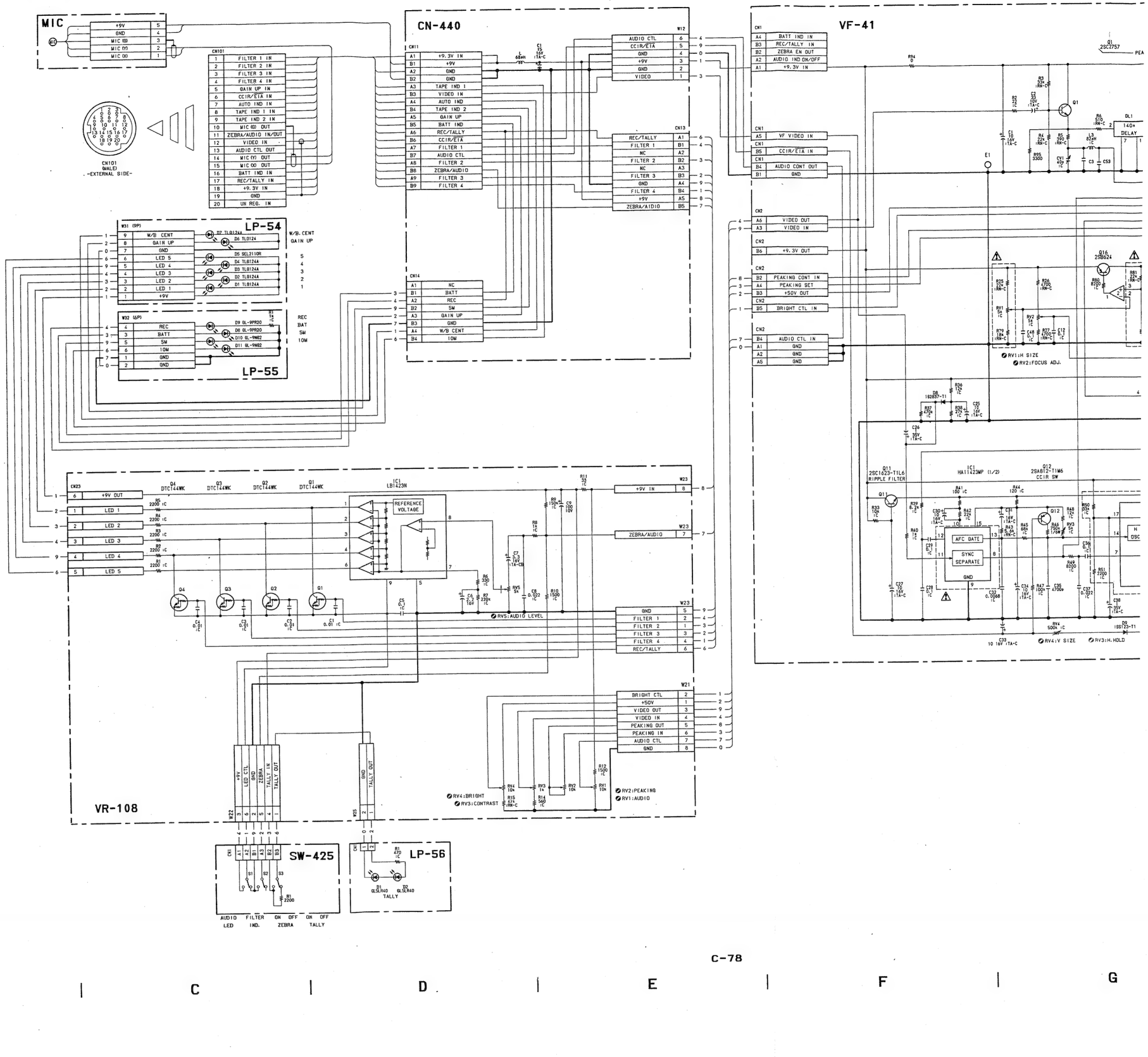
VF-41 (1-633-204-12)

CN1	D - 7	RV1	C - 3
CN2	D - 4	RV2	D - 3
CN4	D - 8	RV3	D - 7
CN5	D - 3	RV4	C - 6
		RV5	C - 7
CV1	B - 4	RV6	D - 8
		RV7	C - 8
D1	B - 4	RV8	B - 5
D2	B - 5	RV9	C - 4
D3	C - 3		
D5	D - 1	TP1	D - 8
D6	A - 2	TP2	D - 2
D7	B - 5	TP3	D - 8
D8	C - 6	TP4	D - 5
D9	C - 6		
D10	C - 8	T1	D-2
D11	B - 2		
D12	D - 8	VDR1	D - 3
D13	A - 1		
DL1	C - 4		
E1	D - 5		
IC1	C - 6		
IC2	C - 1		
IC3	C - 2		
IC4	D - 8		
Q1	D - 2		
Q2	C - 4		
Q3	B - 4		
Q4	B - 6		
Q5	C - 6		
Q6	C - 3		
Q7	C - 4		
Q8	B - 3		
Q9	A - 3		
Q10	C - 3		
Q11	D - 6		
Q12	C - 7		
Q13	C - 8		
Q14	B - 7		
Q15	C - 8		
Q16	D - 1		
Q17	B - 5		
Q18	C - 4		

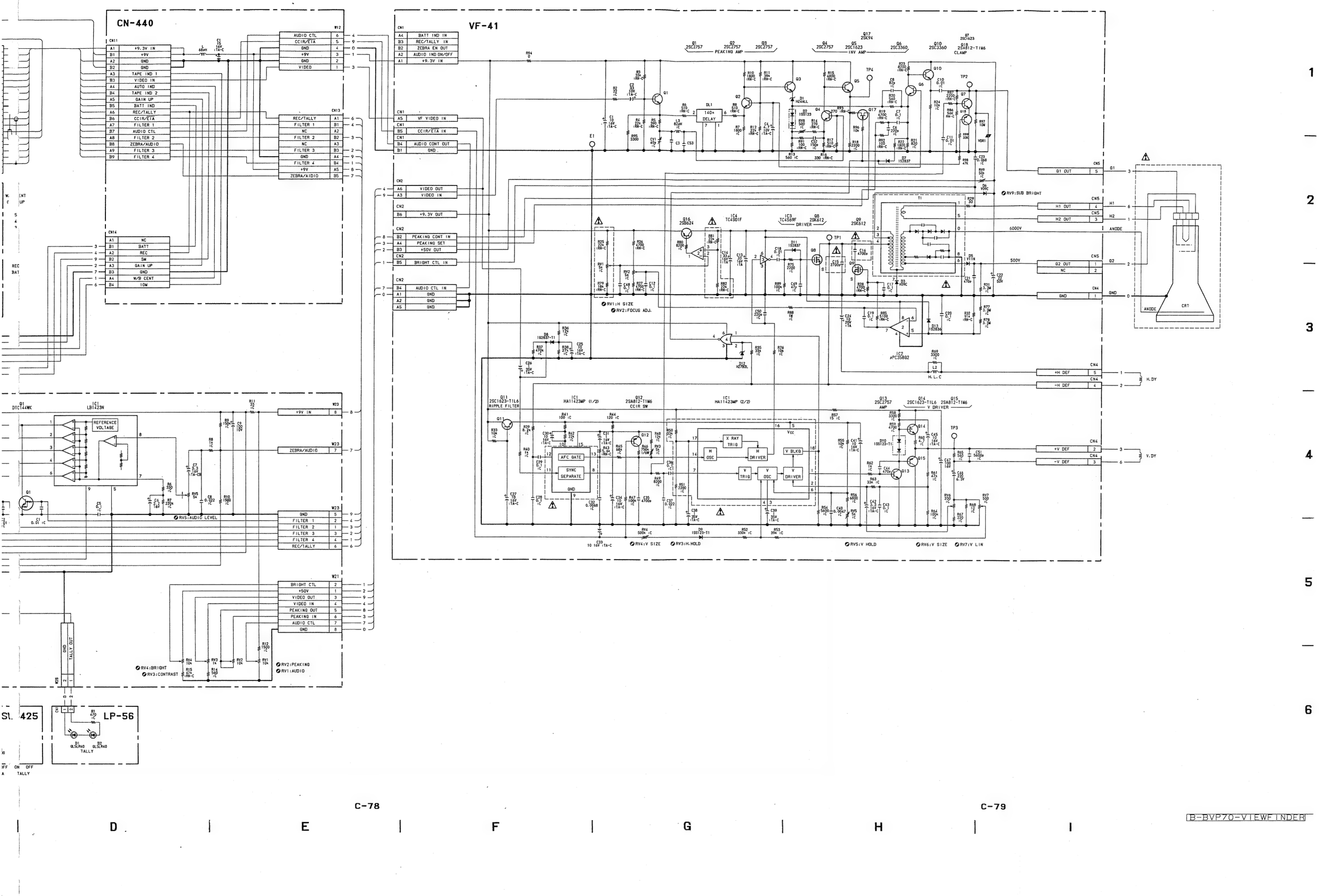
VIEWFINDER CN-440 LP-54 LP-55 LP-56
SW-425 VF-41 VR-108

VIEWFINDER BLOCK

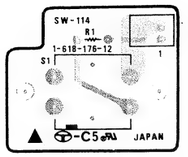
- CN-440 BOARD
- LP-54 BOARD
- LP-55 BOARD
- LP-56 BOARD
- SW-425 BOARD
- VF-41 BOARD
- VR-108 BOARD



CN-440 LP-54 LP-55 LP-56 VIEWFINDER
SW-425 VF-41 VR-108

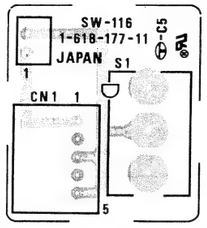


SW-114 BOARD



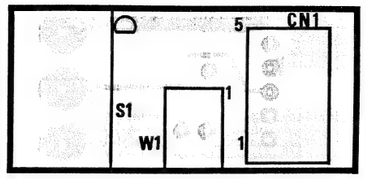
1-618-176-12 SOLDERING SIDE

SW-116 BOARD



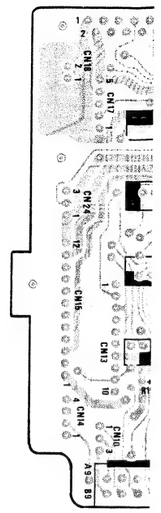
1-618-177-11 COMPONENT SIDE
1-618-177-11 SOLDERING SIDE

SW-256 BOARD

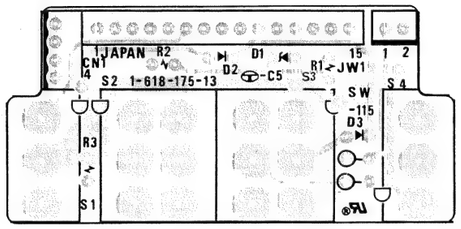


1-623-749-12 COMPONENT SIDE
1-623-749-12 SOLDERING SIDE

HN-135 BOA

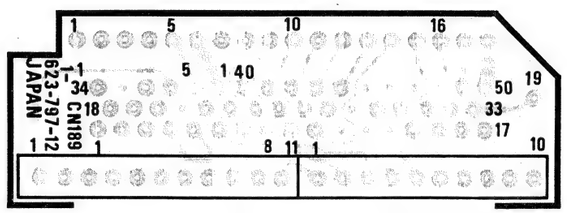


SW-115A BOARD

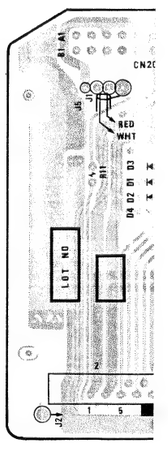


1-618-175-13 COMPONENT SIDE
1-618-175-13 SOLDERING SIDE

CN-189 BOARD

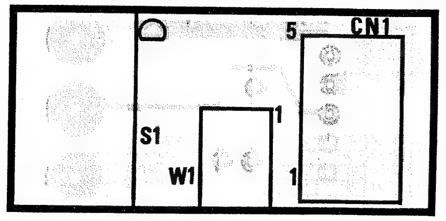


1 623 797 12 COMPONENT SIDE
1-623-797-12 SOLDERING SIDE



1-630-558 11 SC

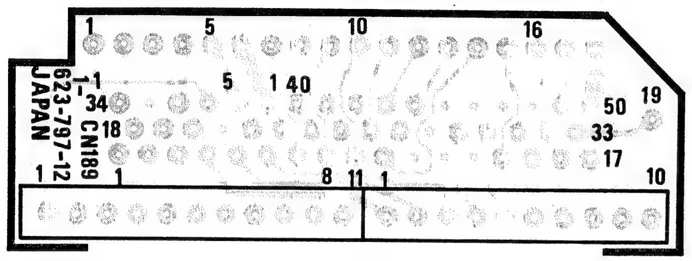
SW-256 BOARD



1 623 749 12 COMPONENT SIDE

1-623-749-12 SOLDERING SIDE

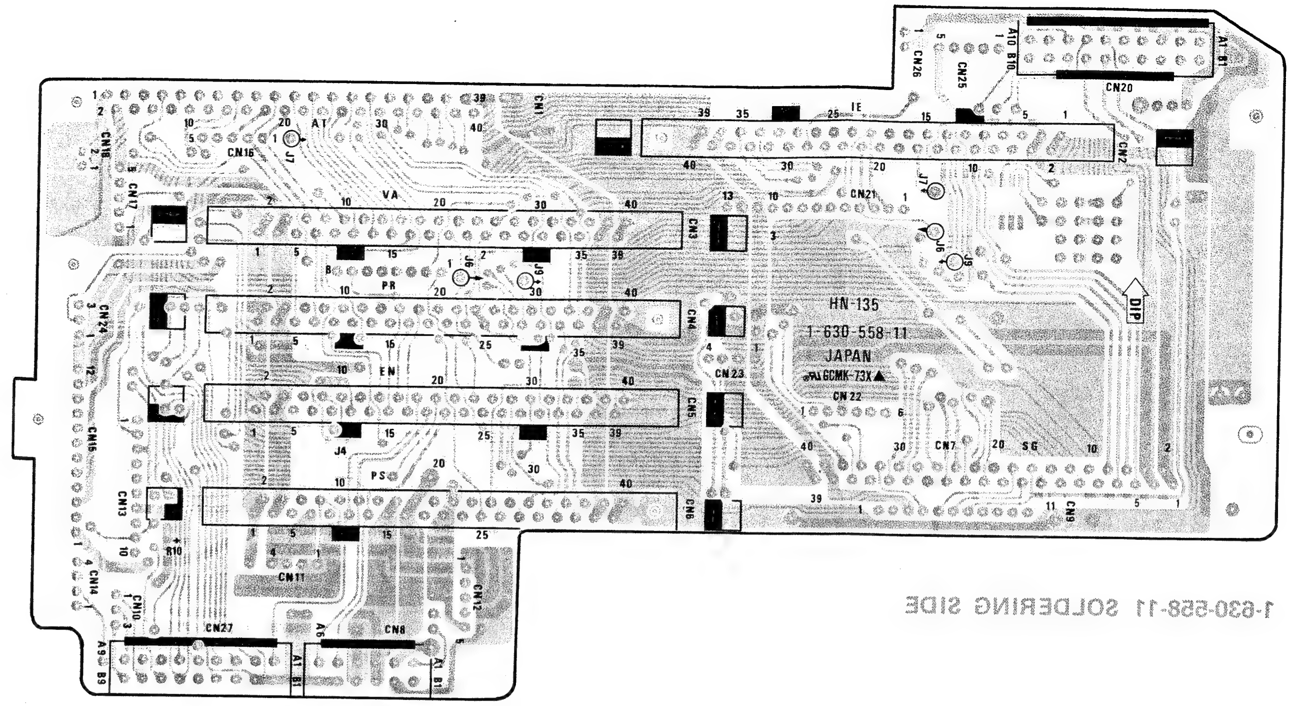
CN-189 BOARD



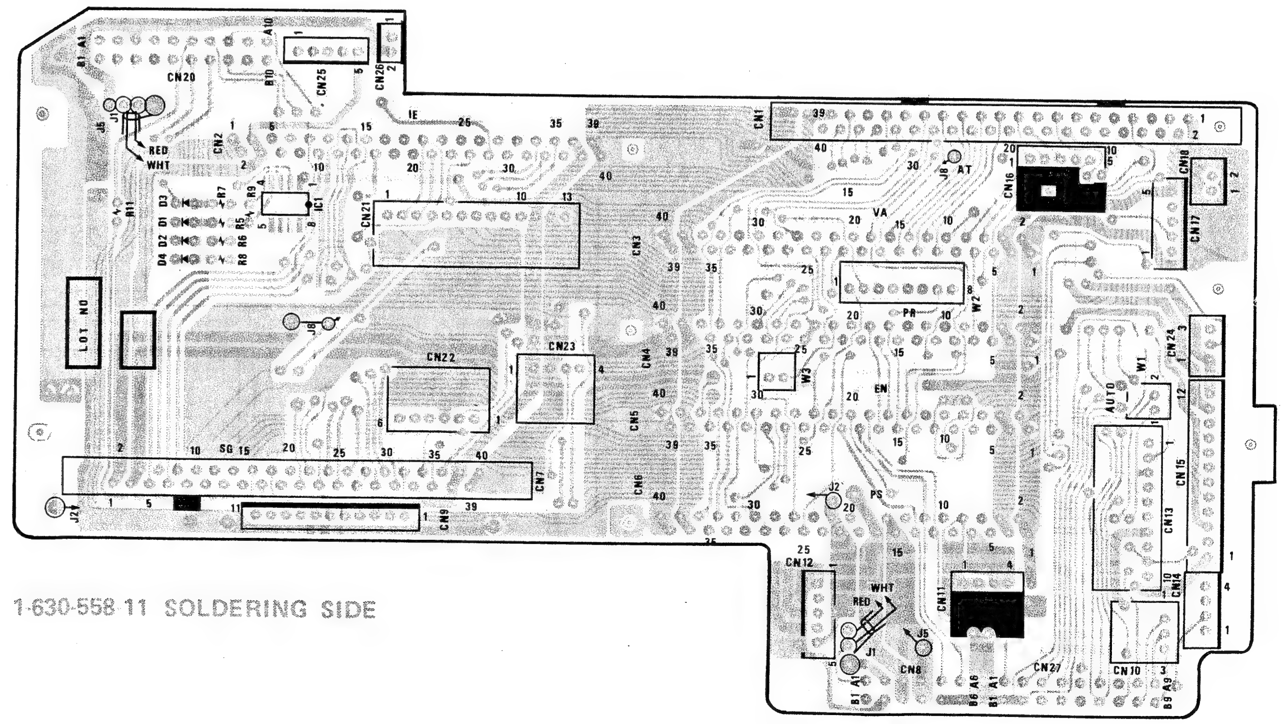
1 623 797 12 COMPONENT SIDE

1-623-797-12 SOLDERING SIDE

HN-135 BOARD

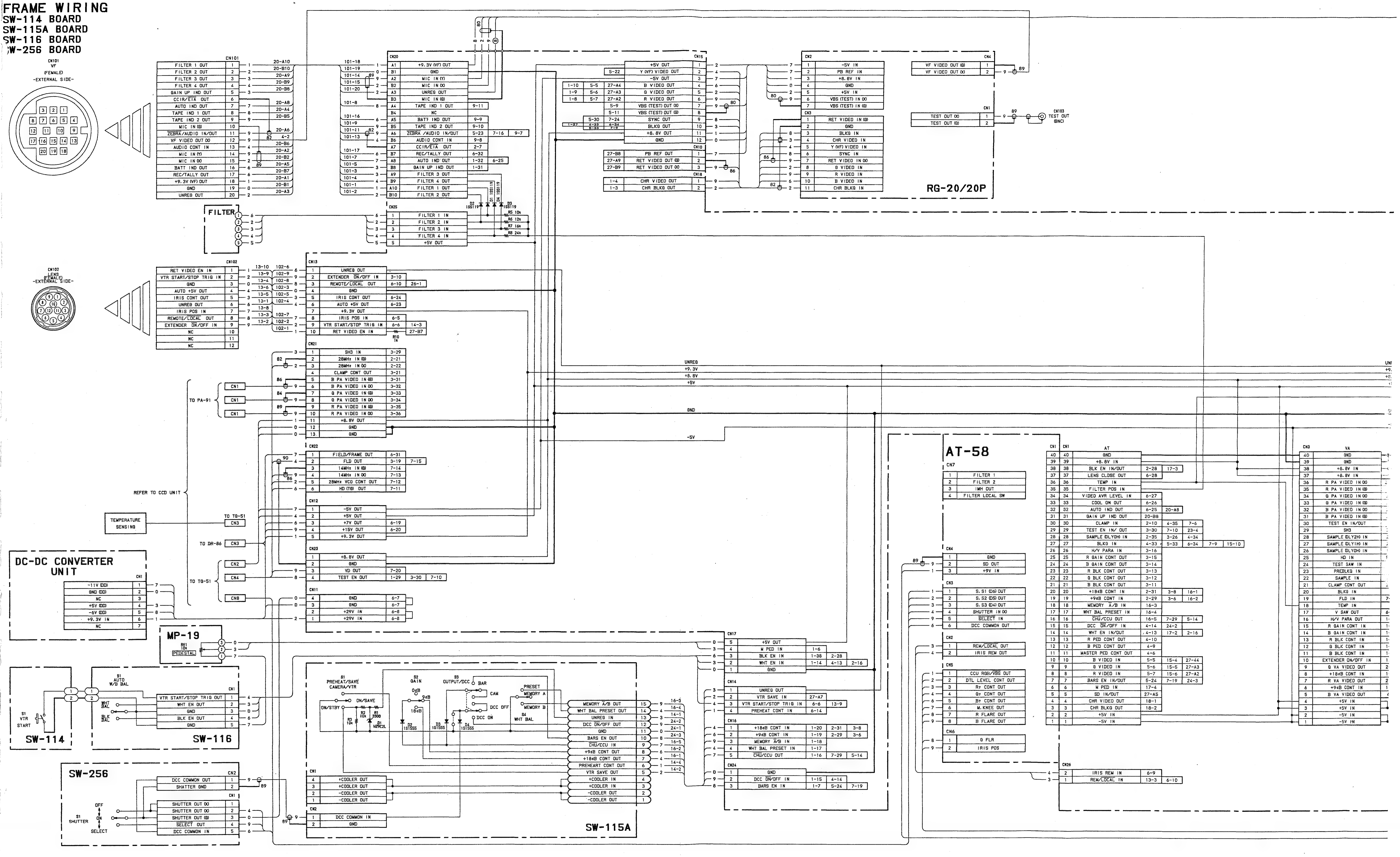


1-630-558-11 SOLDERING SIDE



1-630-558-11 SOLDERING SIDE

FRAME WIRING
SW-114 BOARD
SW-115A BOARD
SW-116 BOARD
SW-256 BOARD



SW-114 SW-115A
SW-116 SW-256 FRAME

FRAME SW-114 SW-115A
SW-116 SW-256

CN2	IE				
1	-5V IN				
2	-5V IN				
3	+5V IN				
4	+5V IN				
5	NC				
6	G IE VIDEO OUT	4-32			
7	CCIR/ EIA OUT	20-A7			
8	NC				
9	PREBLKG IN	3-23	4-23	7-5	
10	CLAMP IN	1-30	4-35	7-6	
11	NC				
12	DTL 1 OUT	4-26			
13	DTL 2 OUT	4-27			
14	DTL LEVEL CONT IN				
15	NC				
16	WHT EN IN	1-14	4-13	17-2	
17	NC				
18	NC				
19	NC				
20	NC				
21	28MHz IN (G)	21-2			
22	28MHz IN (R)	21-3			
23	NC				
24	NC				
25	NC				
26	SAMPLE IN	3-22	7-6		
27	B VA VIDEO IN	3-5	4-5		
28	BLK EN IN	1-38	17-3		
29	+9dB CONT IN	1-19	3-6	16-2	
30	R VA VIDEOIN	3-7	4-7		
31	+18dB CONT IN	1-20	3-8	16-1	
32	G VA VIDEO IN	3-9			
33	SAMPLE DLY2H0 OUT	3-28			
34	SAMPLE DLY1H0 OUT	3-27			
35	SAMPLE DLY0H0 OUT	1-28	3-26	4-34	
36	NC				
37	+8.8V IN				
38	+8.8V IN				
39	GND				
40	GND				

CN7	SG					
1	-5V IN					
2	-5V IN					
3	+5V IN					
4	+5V IN					
5	PREBLKG OUT	2-9	3-23	4-23		
6	CLAMP OUT	1-30	2-10	4-35		
7	TEST SAW OUT	3-24				
8	SAMPLE OUT	2-26	3-22			
9	BLKG OUT	1-27	4-33	5-33	6-34	15-10
10	TEST EN IN	1-29	3-30	23-4		
11	HD (T@) OUT	22-6				
12	28MHz VCO CONT OUT	22-5				
13	14MHz IN 00	22-4				
14	14MHz IN (G)	22-3				
15	FLD OUT	3-19	22-2			
16	ZEBRA /AUDIO IN	5-23	9-7	20-A6		
17	GENLOCK IN 00	9-6				
18	GENLOCK IN (G)	9-5				
19	BARS EN IN	1-7	5-24	24-3		
20	VD OUT	23-3				
21	BARS CK OUT (G)	5-35				
22	BARS CK OUT 00	5-36				
23	L ALT OUT	5-25				
24	SYNC OUT	5-30	15-9			
25	SC OUT (G)	5-32				
26	SC OUT 00	5-31				
27	BF CLAMP OUT	5-29				
28	BF OUT	5-28				
29	CHU/CCU	5-14	1-16	16-5		
30		5-13				
31		5-12				
32	CF OUT	9-4				
33	ZEBRA CK OUT 00	5-27				
34	ZEBRA CK OUT (G)	5-26				
35	CCU RGB/ VBS IN					
36	HD OUT	3-25	5-34	6-36		
37	+8.8V IN					
38	+8.8V IN					
39	GND					
40	GND					

UNREG
+9.3V
+8.8V
+5V
GND
-5V

IC1
AN6701S
TEMPERATURE SENSING

CN3	VA				
40	GND				
39	GND				
38	+8.8V IN				
37	+8.8V IN				
36	R PA VIDEO IN 00	21-10			
35	R PA VIDEO IN (G)	21-9			
34	G PA VIDEO IN 00	21-8			
33	G PA VIDEO IN (G)	21-7			
32	B PA VIDEO IN 00	21-6			
31	B PA VIDEO IN (G)	21-5			
30	TEST EN IN/OUT	1-29	7-10	23-4	
29	SW3	21-1			
28	SAMPLE DLY2H0 IN	2-33			
27	SAMPLE DLY1H0 IN	2-34			
26	SAMPLE DLY0H0 IN	1-28	2-35	4-34	
25	HD IN	5-34	6-36	7-36	
24	TEST SAW IN	7-7			
23	PREBLKG IN	2-9	4-23	7-5	
22	SAMPLE IN	2-26	7-8		
21	CLAMP CONT OUT	21-4			
20	BLKG IN				
19	FLD IN	7-15	22-2		
18	TEMP IN				
17	V SAW OUT	6-29			
16	H/V PARA OUT	1-26			
15	R GAIN CONT IN	1-25			
14	B GAIN CONT IN	1-24			
13	R BLK CONT IN	1-23			
12	G BLK CONT IN	1-22			
11	B BLK CONT IN	1-21			
10	EXTENDER ON/OFF IN	13-2			
9	G VA VIDEO OUT	2-32			
8	+18dB CONT IN	1-20	2-31	16-1	
7	R VA VIDEO OUT	2-30	4-7		
6	+9dB CONT IN	1-19	2-29	16-2	
5	B VA VIDEO OUT	4-5	2-27		
4	+5V IN				
3	+5V IN				
2	-5V IN				
1	-5V IN				

CN4	PR					
40	GND					
39	GND					
38	+8.8V IN					
37	+8.8V IN					
36	NAM Y OUT	6-30				
35	CLAMP IN	1-30	2-10	7-6		
34	SAMPLE DLY0H0 IN	1-28	2-35	3-26		
33	BLKG IN	5-33	6-34	7-9	1-27	15-10
32	G IE VIDEO IN	2-6				
31	M. KNEE					
30	BF IN					
29	G FLR					
28	R FLR					
27	DTL 2 IN	2-13				
26	DTL 1 IN	2-12				
25	GND					
24	GND					
23	PREBLKG IN	2-9	3-23	7-5		
22	G FLR					
21	R FLARE					
20	B FLARE					
19	NC					
18	R PR VIDEO OUT	5-17				
17	G PR VIDEO OUT	5-16				
16	B PR VIDEO OUT	5-15				
15	NC					
14	DCC ON/OFF IN	1-15	24-2			
13	WHT EN IN	1-14	17-2	2-16		
12	NC					
11	NC					
10	R PED CONT IN	1-13				
9	B PED CONT IN	1-12				
8	NC					
7	R VA VIDEO IN	2-30	3-7			
6	MASTER PED CONT IN	1-11				
5	B VA VIDEO IN	3-5				
4	+5V IN					
3	+5V IN					
2	-5V IN					
1	-5V IN					

CN5	EN					
40	GND					
39	GND					
38	+8.8V IN					
37	+8.8V IN					
36	BARS CK IN 00	7-22				
35	BARS CK IN (G)	7-21				
34	HD IN	3-25	6-36	7-36		
33	BLKG IN	4-33	6-34	7-9	1-27	15-10
32	SC IN (G)	7-25				
31	SC IN 00	7-26				
30	SYNC IN	7-24	15-9			
29	BF CLAMP IN	7-27				
28	BF IN	7-28				
27	ZEBRA CK IN 00	7-33				
26	ZEBRA CK IN (G)	7-34				
25	L ALT IN	7-23				
24	BARS EN IN	1-7	7-19	24-3		
23	ZEBRA /AUDIO IN	7-16	9-7	20-A6		
22	Y (VF) VIDEO OUT	15-2				
21	Y VIDEO OUT 00	6-13	8-A5			
20	SYNC (VTR) OUT	27-B4				
19	R-Y VIDEO OUT 00	6-12	8-A6			
18	B-Y VIDEO OUT 00	6-11	27-A1			
17	R PR VIDEO IN	4-18				
16	G PR VIDEO IN	4-17				
15	B PR VIDEO IN	4-16				
14	CHU/CCU	7-29	1-16	16-5		
13		7-30				
12		7-31				
11	VBS (TEST) OUT (G)	15-8				
10	VBS OUT (G)	27-B6				
9	VBS (TEST) OUT 00	15-7				
8	VBS OUT 00	27-A6				
7	R VIDEO OUT	1-8	15-6	27-A2		
6	G VIDEO OUT	1-9	15-5	27-A3		
5	B VIDEO OUT	1-10	15-4	27-A4		
4	+5V IN					
3	+5V IN					
2	-5V IN					
1	-5V IN					

CN6	PS					
40	GND					
39	GND					
38	+8.8V OUT					
37	+8.8V OUT					
36	HD IN	3-25	5-34	7-36		
35	REC ALARM IN	9-1				
34	BLKG IN	4-33	5-33	7-9	1-27	15-10
33	VTR START/STOP OUT	9-2				
32	REC/TALLY OUT	20-B7				
31	FIELD/ FRAME OUT	22-1				
30	NAM Y IN	4-36				
29	V SAW IN	3-17				
28	LENS CLOSE IN	1-37				
27	VIDEO AVR LEVEL OUT	1-34				
26	COOL ON IN	1-33				
25	AUTO IND IN	1-32	20-A8			
24	IRIS CONT OUT	13-5				
23	AUTO +5V OUT	13-6				
22	+9.3V (VF) OUT					
21	+9.3V OUT					
20	+15V OUT	12-4				
19	+6.5V OUT	12-3				
18	UNREG (GND)					
17	UNREG (GND)					
16	UNREG IN					
15	UNREG IN					
14	PREHEAT CONT IN	14-4				
13	Y VIDEO IN 00	5-21	8-A5			
12	R-Y VIDEO IN 00	5-19	8-A6			
11	B-Y VIDEO IN 00	5-18	27-A1			
10	REM/ LOCAL IN	13-3	26-1			
9	IRIS REM IN	26-2				
8	+29V IN	11-1	11-2			
7	GND	11-3	11-4			
6	VTR START/STOP TRIG IN	13-9	14-3			
5	IRIS POS IN	13-8				
4	+5V OUT					
3	+5V OUT					
2	-5V OUT					
1	-5V OUT					

W3: IRIS POS, G. FLR

B. FLARE IN, R. FLARE IN, M. KNEE IN, BF IN, G IN, R IN, DTL LEVEL CONT IN, CCU RGB/VBS IN

CN9		
6-35	REC ALARM IN	1
6-33	VTR START/STOP OUT	2
	+8.8V OUT	3
7-32	CF OUT	4
7-18	GENLOCK IN (G)	5
7-17	GENLOCK IN 00	6
20-A6	ZEBRA /AUDIO IN	7
20-B6	AUDIO CONT OUT	8
20-A5	BATT IND IN	9
20-B5	TAPE IND 2 IN	10
20-A4	TAPE IND 1 IN	11

R11 220Ω: 5-23 — 7-16

CN8		
	WIC OUT 00	A1
	WIC OUT (Y)	B1
	WIC OUT (G)	A2
	-5V OUT	B2
	UNREG (GND)	A3
	UNREG (GND)	B3
	UNREG IN	A4
	UNREG IN	B4
5-21	Y VIDEO OUT 00	A5
	Y VIDEO OUT (G)	B5
5-19	R-Y VIDEO OUT 00	A6
	R-Y VIDEO OUT (G)	B6

CN27		
5-18	B-Y VIDEO OUT 00	A1
	B-Y VIDEO OUT (G)	B1
1-8 5-7 15-6	R VIDEO OUT	A2
	RGB (GND)	B2
1-9 5-6 15-5	G VIDEO OUT	A3
	NC	B3
1-10 5-5 15-4	B VIDEO OUT	A4
5-20	SYNC (VTR) OUT	B4
1-5	SD IN/OUT	A5
	AUDIO MONITOR IN	B5
5-8	VBS OUT 00	A6
5-10	VBS OUT (G)	B6
14-2	VTR SAVE OUT	A7
13-10	RET VIDEO EN OUT	B7
	SHUT CLOSE IN	A8
10-1	PB REF IN	B8
10-2	RET VIDEO IN (G)	A9
10-3	RET VIDEO IN 00	B9

CN-189

CN2		
1	CF OUT	104-37
2	GENLOCK OUT 00	104-1
3	GENLOCK OUT (G)	104-2
4	+8.8V IN	104-3
5	ZEBRA/AUDIO OUT	104-20
6	TAPE IND 2 OUT	104-22
7	TAPE IND 1 OUT	104-23
8	REC ALARM OUT	104-24
9	BATT IND OUT	104-25
10	VTR START/STOP IN	104-27
11	AUDIO CONT IN	104-31

CN1		
1	-5V IN	104-4
2	UNREG (GND)	104-5
3	UNREG (GND)	104-6
4	R-Y VIDEO IN 00	104-29
5	R-Y VIDEO IN (G)	104-30
6	WIC IN (G)	104-15
7	WIC IN 00	104-16
8	WIC IN (Y)	104-17
9	Y VIDEO IN (G)	104-42
10	Y VIDEO IN 00	104-41

27-B4 27-B9	SYNC (VTR) IN	104-34
	RET VIDEO OUT 00	104-18
	RET VIDEO OUT (G)	104-19
27-A8	SHUT CLOSE OUT	104-36
27-B7	RET VIDEO EN IN	104-38
8-A4	UNREG OUT	104-39
8-B4	UNREG OUT	104-40
27-A2	R VIDEO IN	104-7
27-A3	G VIDEO IN	104-8
27-A4	B VIDEO IN	104-9
27-B8	PB REF OUT	104-26
27-A6	VBS IN 00	104-43
	VBS IN (G)	104-44
27-B2	RGB (GND)	104-10
27-A5	SD IN/OUT	104-14
27-A7	VTR SAVE IN	104-32
27-A1	B-Y VIDEO IN 00	104-49
	B-Y VIDEO IN (G)	104-50
27-B5	AUDIO MONITOROUT	104-33

CN104		
2-2	GENLOCK IN 00	1
2-3	GENLOCK IN (G)	2
2-4	+8.8V OUT	3
1-1	-5V OUT	4
1-2	UNREG (GND)	5
1-3	UNREG (GND)	6
6	R VIDEO OUT	7
9	G VIDEO OUT	8
10	B VIDEO OUT	9
14	RGB (GND)	10
	NC	11
	NC	12
	NC	13
15	SD IN/OUT	14
1-6	WIC OUT (G)	15
1-7	WIC OUT 00	16
1-8	WIC OUT (Y)	17
2	RET VIDEO IN 00	18
3	RET VIDEO IN (G)	19
2-5	ZEBRA /AUDIO IN	20
	NC	21
2-6	TAPE IND 2 IN	22
2-7	TAPE IND 1 IN	23
2-8	REC ALARM IN	24
2-9	BATTIND IN	25
11	PB REF IN	26
2-10	VTR START/ STOP OUT	27
	NC	28
1-4	R-Y VIDEO OUT 00	29
1-5	R-Y VIDEO OUT (G)	30
2-11	AUDIO CONT OUT	31
12	VTR SAVE OUT	32
13	AUDIO MONITOR IN	33
1	SYNC (VTR) OUT	34
	NC	35
4	SHUT CLOSE IN	36
2-1	CF OUT	37
5	RET VIDEO EN OUT	38
6	UNREG IN	39
7	UNREG IN	40
1-10	Y VIDEO OUT 00	41
1-9	Y VIDEO OUT (G)	42
12	VBS OUT 00	43
13	VBS OUT (G)	44
	NC	45
	NC	46
	NC	47
	NC	48
17	B-Y VIDEO OUT 00	49
18	B-Y VIDEO OUT (G)	50

CN104
-EXTERNAL SIDE-
(MALE)

CN105
REMOTE
6P (FEMALE)

HN-135

C-85 C-86

FRAME WIRING
BVP-70 (J, UC)
BVP-70P (EK)

B-BVP70-FRAME/M

SECTION D
SPARE PARTS

PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading marked with ! on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "**accommodating the improved parts and/or engineering changes**" or "**standardization of genuine parts.**" This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present." Regarding engineering parts and diagrams changes in our engineering department, refer SECTION 9. CHANGE INFORMATION.

3. **The parts marked with "S" in the SP column** of the exploded views and electical spare parts list are nomally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.

4. Item with no parts number and/or no description are not stocked because they are seldom required for routine service.

5. **Abbreviation**

REF.No.	DESCRIPTION	REF.No.	DESCRIPTION	REF.No.	DESCRIPTION
C	CAPACITOR	IC	IC	R	RESISTOR
CN	CONNECTOR	L	INDUCTOR	RV	VARIABLE RESISTOR
CP	COMBINATION PARTS	LV	VARIABLE INDUCTOR	T	TRANSFORMER
D	DIODE	Q	TRANSISTOR	VDR	OSCILLATOR
FB	FERRITE BEAD RIND	S	SWITCH	X	OSCILLATOR
FL	FILTER				

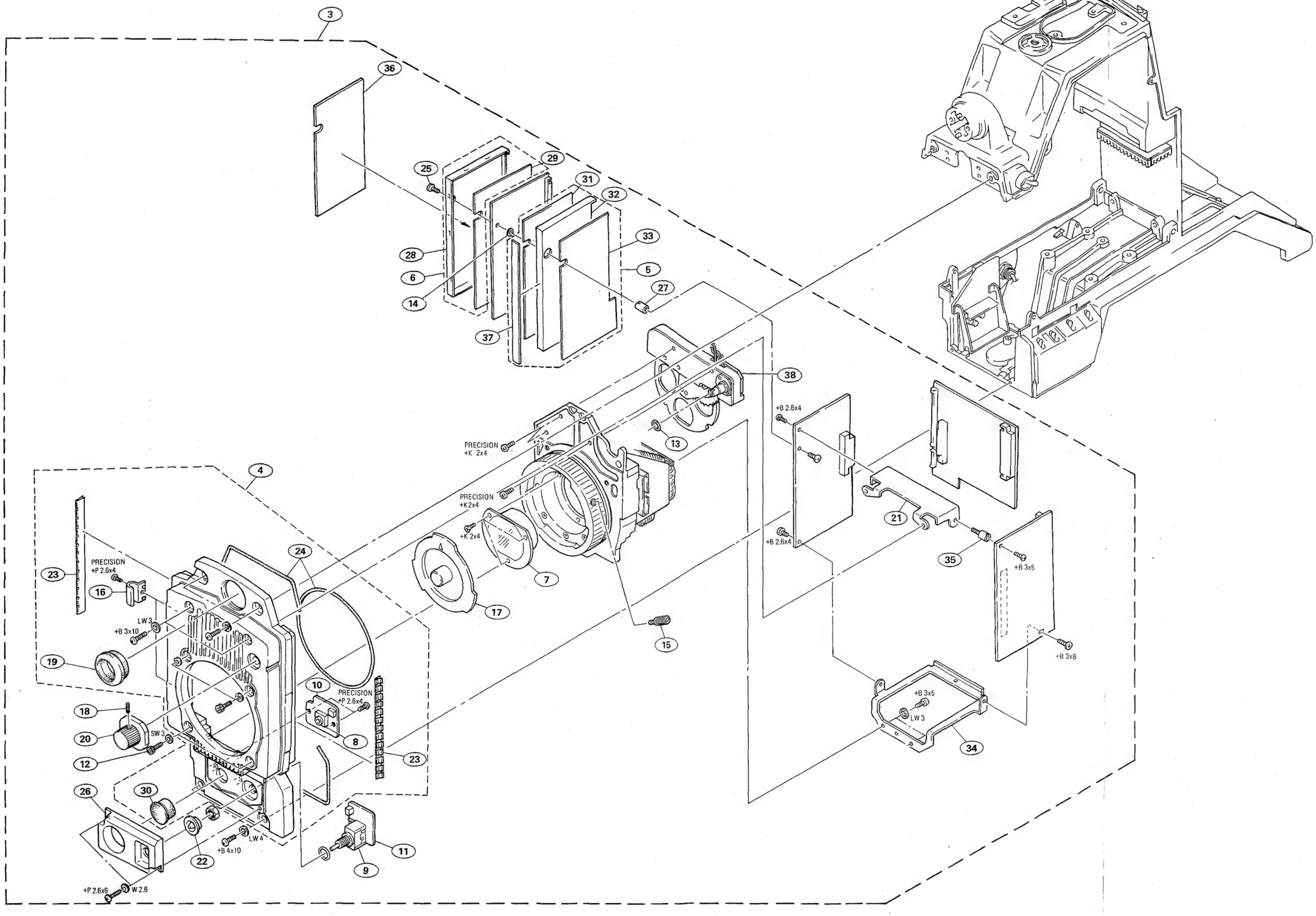
All capacitors are in micro farads unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

EXPLODED VIEW

FRONT ASS'Y

No.	Parts No.	SP	Description
3	A-7575-153-A	s	CCD UNIT (N) (J,UC) FOR BVP-70
	A-7575-154-A	s	CCD UNIT (P) (EK) FOR BVP-70P
	A-7575-145-A	s	CCD UNIT-IS (N) (J,UC) FOR BVP-70IS
	A-7575-146-A	s	CCD UNIT-IS (P) (EK) FOR BVP-70ISP
4	A-7612-355-A	s	PANEL ASSY, FRONT
5	X-3710-064-3	o	CASE ASSY, SHIELD
6	X-3710-067-3	o	COVER ASSY, SHIELD
7	1-547-360-11	o	FILTER UNIT, OPTICAL
8	1-552-539-11	s	SWITCH, KEY BOARD "VTR START"
9	1-554-395-11	s	SWITCH, TOGGLE "A W/B BAL"
10	1-618-176-12	o	PRINTED CIRCUIT BOARD "SW-114"
11	1-618-177-11	o	PRINTED CIRCUIT BOARD "SW-116"
12	2-623-773-11	s	BOLT (M3x8), STAINLESS
13	3-146-316-21	s	RING, RUBBER
14	3-699-595-00	s	WASHER (2), STOPPER
15	3-678-629-00	s	LEVER, MOUNT
16	3-678-684-00	o	HOLDER, CABLE
17	3-699-048-01	s	CAP, MOUNT
18	3-701-505-00	s	SET SCREW, DOUBLE POINT 3x3
19	3-710-024-01	o	PACKING, VF
20	3-710-054-01	s	KNOB, FILTER
21	3-710-057-02	o	STAY (T), SHIELD PLATE
22	3-711-705-01	o	CAP, DROP PROTECTION
23	3-711-714-11	o	SPRING
24	3-711-715-01	o	RUBBER, SHIELD
25	3-711-767-02	s	SCREW, STOPPER
26	3-734-513-01	s	GUARD (F2), SWITCH
27	3-734-514-01	o	SUPPORT (Y)
28	3-734-515-03	o	COVER, SHIELD
29	3-734-516-04	o	SHEET INSULATING SHIELD CASE
30	3-734-517-04	s	RUBBER, VTR START STOP
31	3-734-518-02	o	SHEET INSULATING SHIELD CASE
32	3-734-519-03	o	COVER, SHIELD
33	3-734-520-01	o	SHEET INSULATING SHIELD CASE
34	3-734-528-01	o	STAY (B4), SHIELD PLATE
35	3-734-535-02	o	SUPPORT (STAY T)
36	3-734-593-02	o	SHEER, SHIELD COVER
37	3-742-206-01	o	SHEET (F), SHIELD COVER
38	3-707-398-01	o	DISK UNIT, FILTER

FRONT ASSY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PRECISION +K 2x4
PRECISION +K 2x4
PRECISION +K 2x4
13
7
17
15
+B 2.6x4
+B 2.6x4
21
35
+B 3x5
+B 3x6
+B 3x5
LW 3
34
4
24
23
PRECISION +P 2.6x4
16
LW 3
+B 3x10
19
10
PRECISION +P 2.6x4
18
20
SW 3
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8
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26
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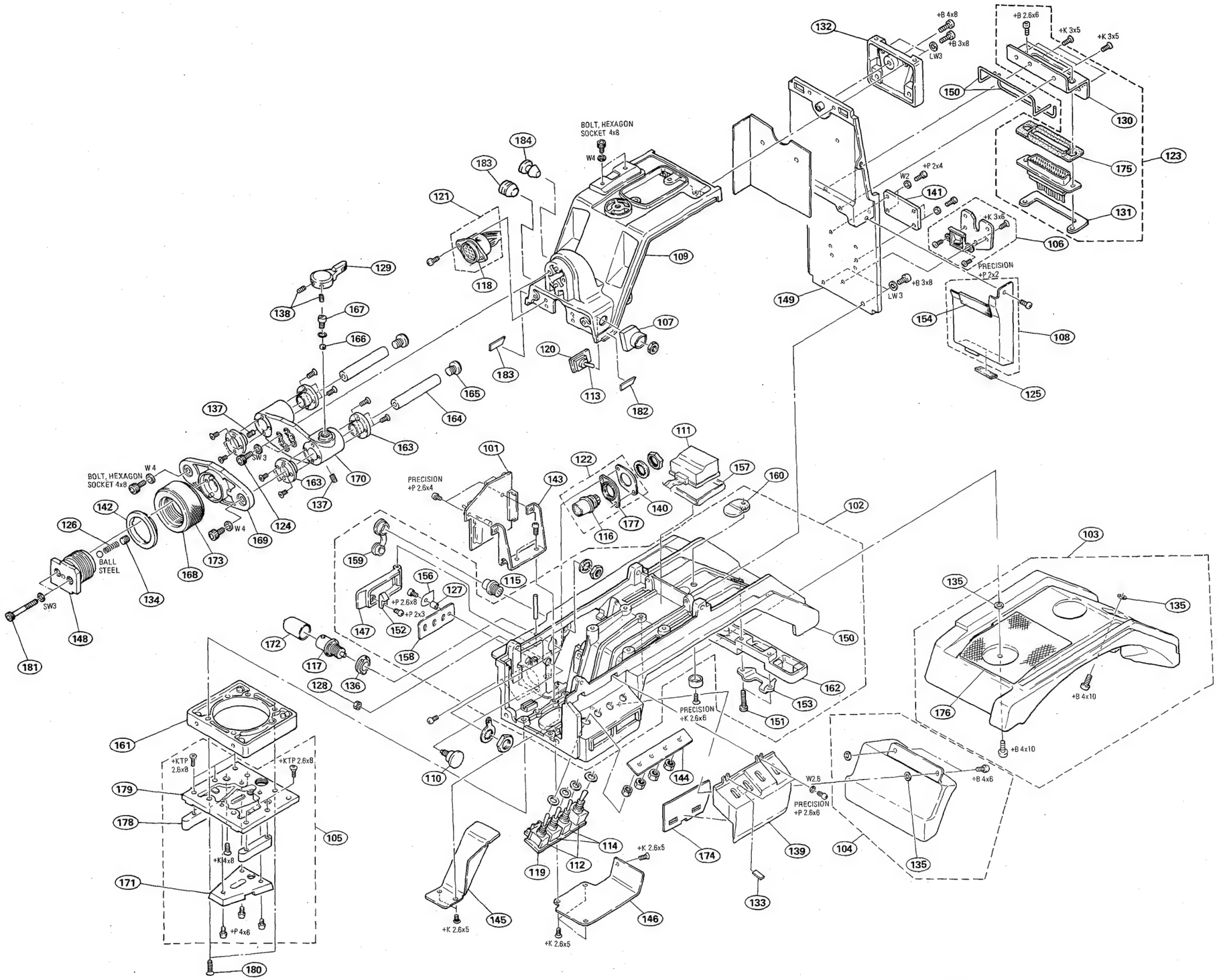
LW 4
+B 4x10
22
11
9
+P 2.6x6
W 2.6

CHASSIS BLOCK



D-5

D-6

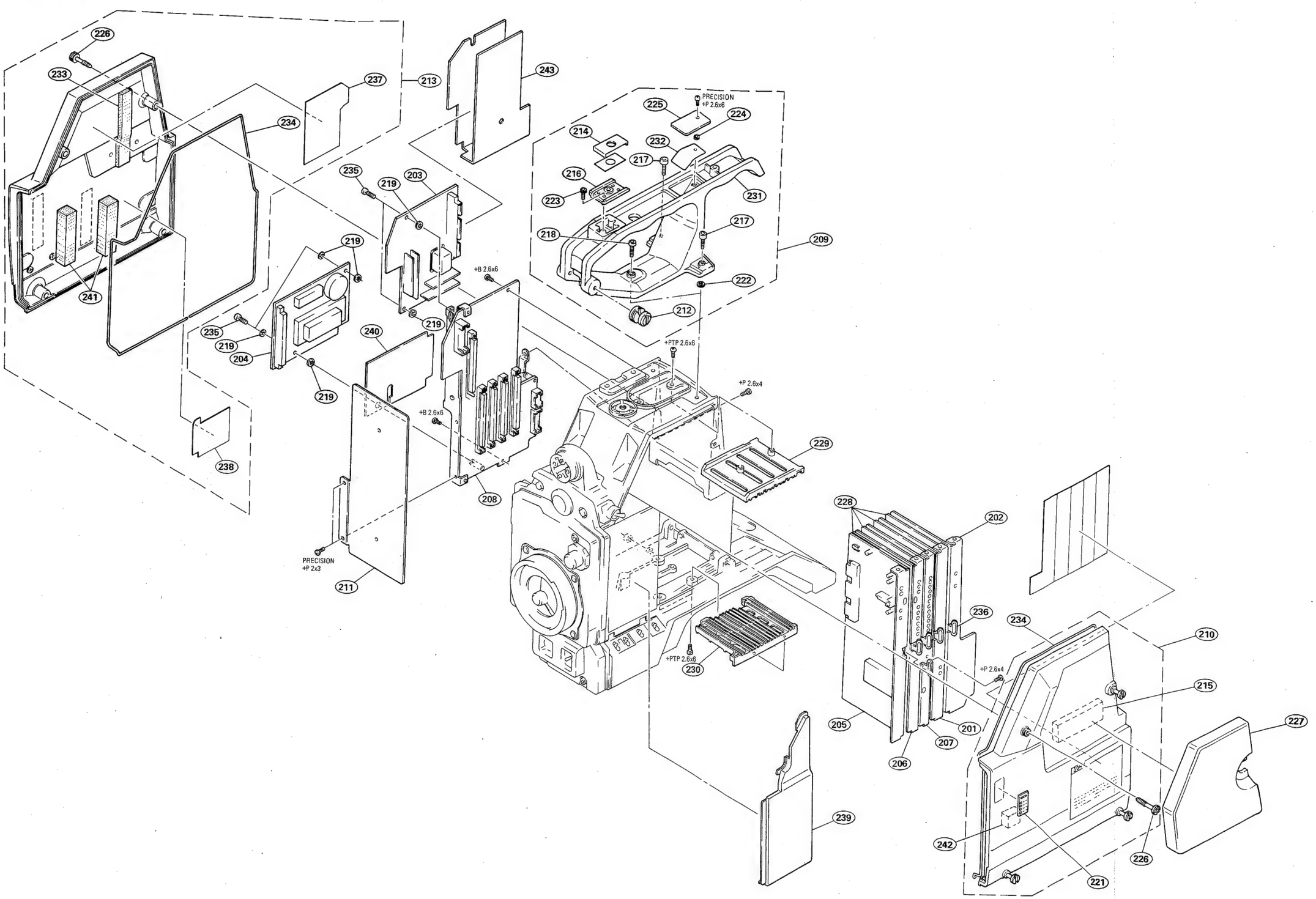
CHASSIS BLOCK

No.	Parts No.	SP	Description
101	A-7513-584-A	o	MOUNTED CIRCUIT BOARD "RG-20" (J,UC)
	A-7513-594-A	o	MOUNTED CIRCUIT BOARD "RG-20P" (EK)
102	A-7550-049-C	o	CHASSIS BLOCK ASSY, BASE
103	A-7612-312-C	s	PAD ASSY (2), SHOULDER
104	A-7612-321-A	s	PAD (2) (SMALL), SHOULDER
105	A-7612-352-A	s	SHOE (A) ASSY, V
106	X-3710-026-1	o	STOPPER ASSY
107	X-3710-029-1	s	GUARD ASSY, SHUTTER
108	X-3710-038-1	o	CASE ASSY, SHIELD
109	X-3710-042-3	o	PLATE (2) ASSY, UPPER
110	1-223-165-00	s	WIREWOUND 10K "PEDESTAL"
111	1-466-158-13	s	CONVERTER UNIT, DC-DC
112	1-554-356-00	s	SWITCH, TOGGLE "CAMERA/VTR" "WHT BAL"
113	1-554-396-00	s	SWITCH, TOGGLE "SHUTTER"
114	1-554-400-00	s	SWITCH, TOGGLE "GAIN" "OUTPUT/DCC"
115	1-561-233-21	s	CONNECTOR, 6P, FEMALE "REMOTE"
116	1-562-221-21	s	CONNECTOR, 12P, MALE "LENS"
117	1-562-261-21	o	CONNECTOR, COAXIAL (BNC) "TEST OUT"
118	1-565-051-11	o	CONNECTOR, ROUND (WITHC) 20P "VF"
119	1-618-175-13	o	PRINTED CIRCUIT BOARD "SW-115A"
120	1-623-749-11	o	PRINTED CIRCUIT BOARD "SW-256"
121	1-937-212-21	o	HARNESS (VF)
122	1-937-218-11	o	HARNESS (LENS)
123	1-939-723-15	o	HARNESS (50P PC BOARD TYPE)
124	2-990-375-11	s	BOLT M3x10, HEXAGON SOCKET
125	3-143-206-00	s	CUSHION A, STOPPER
126	3-641-622-00	s	SPRING, COMPRESSION
127	3-659-365-00	s	SPACER (4x3)
128	3-664-519-00	o	NUT (M4)
129	3-673-046-00	s	LEVER, LOCK
130	3-675-902-21	o	BRACKET (A), CONNECTOR
131	3-675-929-00	o	NUT (50P), PLATE
132	3-675-958-12	o	SHOE, C
133	3-678-601-01	o	LABEL, SWITCH
134	3-682-760-01	o	SCREW (M7-0.75), ADJUSTMENT
135	3-687-116-01	o	WASHER (4), STOPPER
136	3-692-444-01	o	SPACER, BNC INSULATING
137	3-701-506-01	s	SETSCREW, DOUBLE POINT 3x4
138	3-701-508-00	s	SETSCREW, DOUBLE POINT 3x6
139	3-710-001-01	o	COVER, SW INDICATION
140	3-710-002-01	o	BRACKET
141	3-710-017-01	o	PLATE, PROTECTION
142	3-710-018-01	s	COLLAR, SLIDE
143	3-710-026-03	o	PLATE, FIXED, RG-14
144	3-710-027-01	o	SHEET, BLIND
145	3-710-029-02	o	LID (B), B
146	3-710-030-01	s	LID (A), B
147	3-710-031-01	o	COVER, SWITCH
148	3-710-039-03	s	SHOE, SLIDE
149	3-710-047-04	o	PLATE, REAR
150	3-710-049-05	s	CHASSIS, BASE
151	3-710-050-11	s	BOLT (M2.6x15), HEXAGON HOLE
152	3-710-093-01	o	SPACER, SWITCH
153	3-711-703-01	o	STOPPER
154	3-711-704-01	o	COVER, RUBBER
155	3-711-715-01	o	RUBBER SHIELD
156	3-711-727-01	o	SPRING, LEAF
157	3-711-753-01	o	COVER, INSULATING, CONVERTER
158	3-711-754-03	o	PLATE (2), INDICATION, RG
159	3-711-755-01	o	COVER, P-P
160	3-711-760-01	o	SPRING
161	3-711-788-01	o	SPACER, P5
162	3-711-789-01	o	SPACER, REAR
163	3-711-790-01	o	SPACER, (A)
164	3-711-791-01	o	ARM
165	3-711-792-01	o	SCREW
166	3-711-793-01	o	CUSHION, (STOPPER)
167	3-711-794-01	o	PIN, STOPPER
168	3-711-795-01	o	RING (B), LOCK
169	3-711-796-03	o	TABLE. FIXED, VF SHOE
170	3-711-797-06	o	TABLE, FIXED, VF SLIDE
171	3-716-391-01	o	WEDGE, MOUNTING
172	3-717-823-01	s	COVER, BNC
173	3-720-919-01	o	RUBBER, LOCK RING
174	3-720-960-01	o	PACKING, SWITCH
175	3-720-961-01	o	PACKING, 50P
176	3-720-964-01	o	NET (2)
177	3-725-297-01	o	SPACER (LENS)
178	3-729-064-01	o	GUARD (A), CAMERA SHOE
179	3-729-065-01	s	SHOE (A), CAMERA
180	3-729-072-11	s	SCREW, +K4x20
181	4-904-818-01	s	BOLT (3x25), HEXAGON HOLE
182	3-742-218-01	o	PACKING, RIGHT PANEL
183	3-742-219-01	o	PACKING, LEFT PANEL
184	3-644-002-03	o	CUSHION, HANDLE
185	3-683-255-01	o	CAP

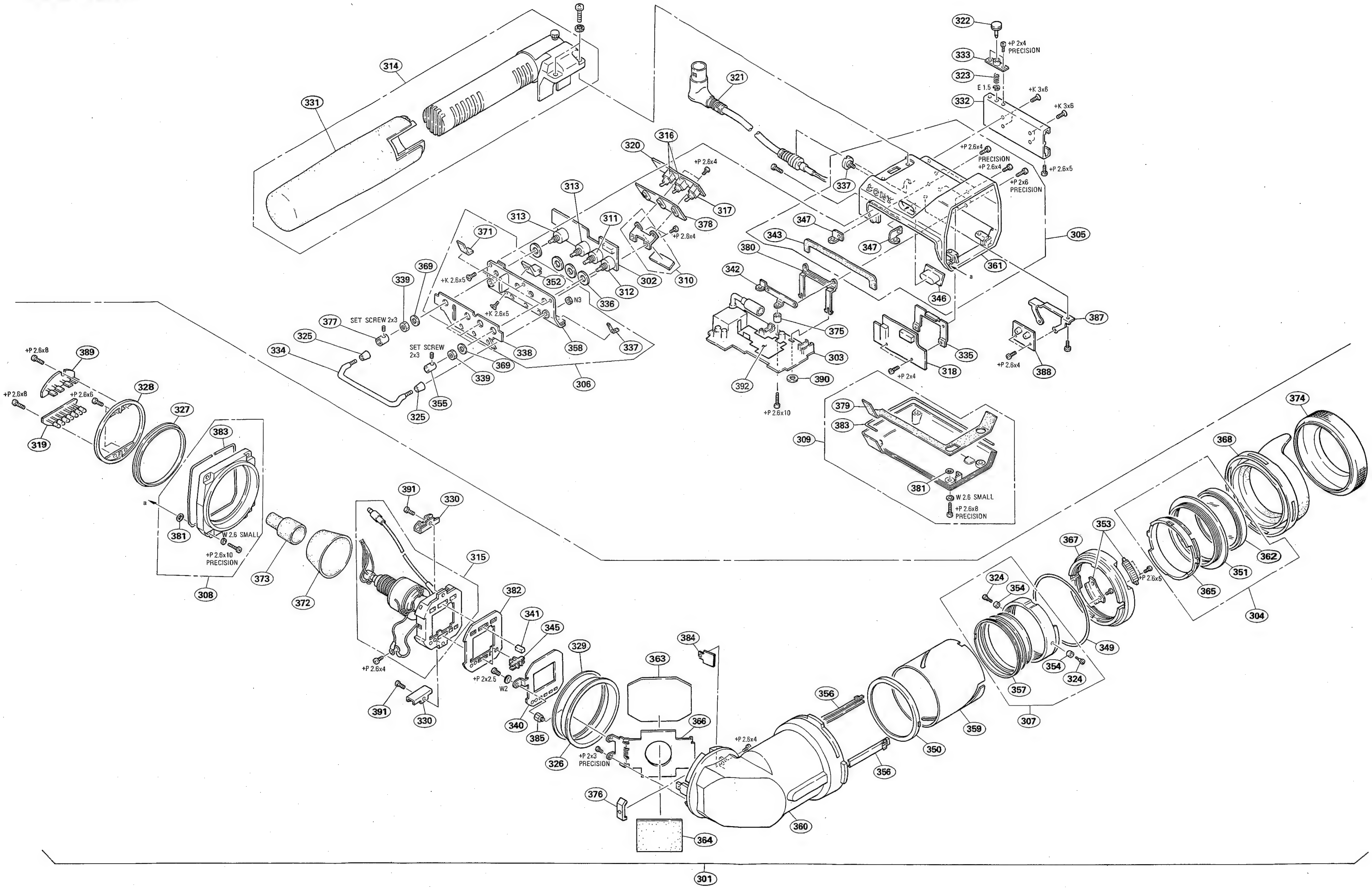
BOARD BLOCK

No.	Parts No.	SP	Description
201	A-7513-618-A	o	MOUNTED CIRCUIT BOARD "EN-69" (J,UC)
	A-7513-619-B	o	MOUNTED CIRCUIT BOARD "EN-69P" (EX)
202	A-7515-126-A	o	MOUNTED CIRCUIT BOARD "PS-224"
203	A-7513-768-A	o	MOUNTED CIRCUIT BOARD "SG-143" (J,UC)
	A-7513-994-A	o	MOUNTED CIRCUIT BOARD "SG-143AP" (EX)
204	A-7515-127-A	o	MOUNTED CIRCUIT BOARD "AT-58"
205	A-7513-989-A	o	MOUNTED CIRCUIT BOARD "IE-25" (J,UC)
	A-7513-990-A	o	MOUNTED CIRCUIT BOARD "IE-25P" (EX)
206	A-7513-991-A	o	MOUNTED CIRCUIT BOARD "VA-85"
207	A-7515-115-A	o	MOUNTED CIRCUIT BOARD "PR-138B" (UC)
	A-7515-116-A	o	MOUNTED CIRCUIT BOARD "PR-138A" (EK,J)
208	A-7513-995-B	o	MOUNTED CIRCUIT BOARD "HN-135"
209	X-3710-003-6	o	HANDLE ASSY
210	X-3710-005-9	s	PANEL ASSY, RIGHT
211	X-3710-007-1	o	PLATE, ASSY, SHIELD, EN
212	X-3710-037-1	o	SUSPENSION ASSY (C)
213	X-3710-065-1	s	PANEL ASSY, LEFT
214	2-277-468-01	o	PLATE, ORNAMENTAL, CAMERA SHOE
215	2-352-317-01	o	CUSHION, PCB
216	3-657-700-00	s	BRACKET, ACCESSORY
217	3-657-705-00	s	BOLT (M4x10), HEXAGON HOLE
218	3-657-705-21	s	BOLT (M4x15), HEXAGON HOLE
219	3-669-595-00	s	WASHER (2), STOPPER
221	3-678-607-02	o	LABEL, FILTER
222	3-687-116-01	o	WASHER (4), STOPPER
223	3-689-039-01	s	BOLT (M2x6), HOLE, HEXAGON
224	3-701-439-11	s	WASHER
225	3-710-015-01	o	LID, HANDLE
226	3-729-091-01	s	SCREW (M4x17.5)
227	3-710-032-01	s	PAD
228	3-710-033-02	o	PLATE, SHIELD, PC BOARD
229	3-710-040-02	o	GUIDE (B)
230	3-710-041-01	o	RAIL (T), GUIDE
231	3-710-044-01	o	HANDLE
232	3-710-053-02	o	VALVE, ADJUSTMENT
233	3-710-076-01	o	CUSHION
234	3-711-715-01	o	RUBBER, SHIELD
235	3-711-767-01	s	SCREW, STOPPER
236	3-711-775-01	o	LEVER, PULL
237	3-711-783-01	o	LAVEL, (SG), PC BOARD
238	3-711-798-02	o	LAVEL, (AT-2), PC BOARD
239	3-720-963-01	o	COVER, OPTICS BLOCK
240	3-742-212-01	o	PLATE, SHIELD, AT
241	4-889-014-00	o	CUSHION, PCB
242	9-911-845-XX	s	RUBBER (A), ABSORBENT
243	3-742-213-11	o	PLATE, SHIELD SG

BOARD BLOCK


226
233
237
213
243
234
235
219
203
225
PRECISION
+P 2.6x6
224
214
232
217
216
223
231
218
209
241
+B 2.6x6
222
212
240
+PTP 2.6x8
+P 2.6x4
229
+B 2.6x6
238
208
PRECISION
+P 2x3
211
228
202
236
234
210
+P 2.6x4
215
205
201
207
206
227
239
242
226
221
+PTP 2.6x6
230

VIEWFINDER


314
331
321
322
+P 2x4 PRECISION
333
323
E 1.5
+K 3x6
332
+K 3x6
316
320
+P 2.6x4
+P 2.6x4 PRECISION
+P 2.6x4
+P 2.6x5
+P 2x6 PRECISION
337
313
317
313
311
378
+P 2.6x4
347
305
371
343
347
380
361
369
+K 2.6x5
352
302
310
342
339
312
336
346
N3
+K 2.6x5
377
SET SCREW 2x3
358
337
387
375
325
338
SET SCREW 2x3
334
369
303
335
389
339
+P 2x4
318
388
+P 2.6x4
+P 2.6x8
306
390
392
328
+P 2.6x8
+P 2.6x6
355
374
327
325
+P 2.6x10
379
319
383
383
368
309
381
W 2.6 SMALL
+P 2.6x8 PRECISION
391
330
381
W 2.6 SMALL
+P 2.6x10 PRECISION
353
367
362
315
373
308
351
372
+P 2.6x5
324
354
365
382
341
304
345
349
329
384
+P 2.6x4
354
324
363
+P 2x2.5
W2
357
391
330
340
385
366
356
359
307
326
+P 2x3 PRECISION
+P 2.6x4
350
356
376
360
364
301

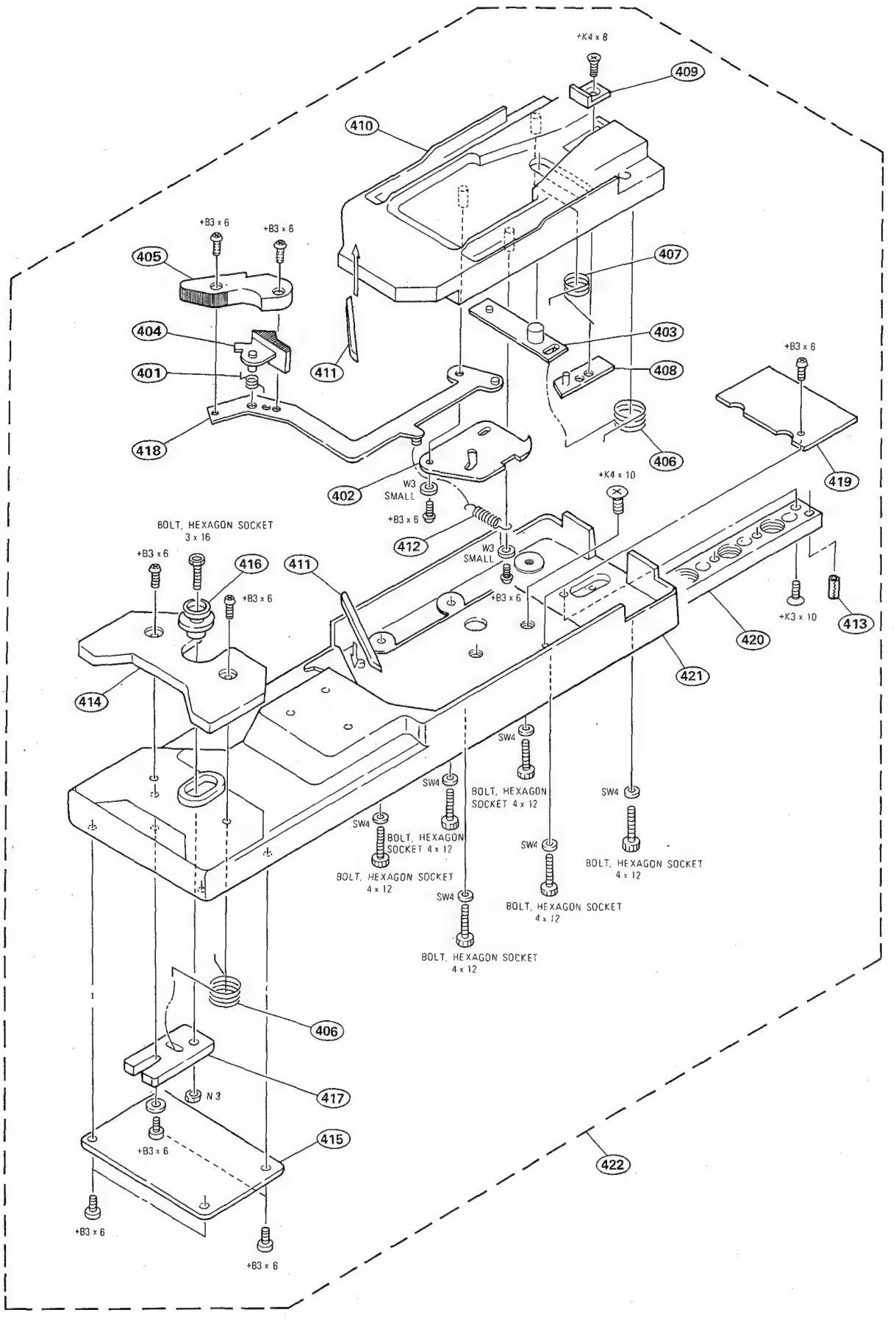
VIEWFINDER

No.	Parts No.	SP	Description
⚠ 301	A-7403-115-A	o	VF COMPLETE ASSY Ser No. 10221 - 11010 (UC) 30356 - 31060 (J) 40386 - 40601 (EK)
	A-7403-130-A	o	VF COMPLETE ASSY Ser No. 11031 - (UC) 31061 - (J) 41001 - (EK)
302	A-7515-106-A	o	MOUNTED CIRCUIT BOARD "VR-108"
⚠ 303	A-7515-107-A	o	MOUNTED CIRCUIT BOARD "VF-41"
304	A-7612-356-B	o	PROTECTOR ASSY, MC
305	X-3710-050-5	o	VF (MAIN) BLOCK ASSY
306	X-3710-055-3	o	BRACKET ASSY (B), VR, SW
307	X-3722-365-2	s	LENS ASSY
308	X-3722-366-6	o	TUBE ASSY, VF ROTARY GUIDE
309	X-3722-368-5	o	LID ASSY, VF
310	X-3722-426-1	o	BRACKET ASSY, SW
311	1-238-290-11	s	RES, VAR, CARBON 1K "CONTRAST"
312	1-238-293-11	s	RES, VAR, CARBON 10K "BRIGHT"
313	1-238-296-11	s	RES, VAR, CARBON 10K "AUDIO LEVEL CH-1" "PEAKING"
314	1-542-106-11	s	MICROPHONE
⚠ 315	1-546-066-22	s	1.5 "CRT ASSY"
316	1-570-984-11	s	SWITCH, TOGGLE "AUDIO/FILTER" "ZEBRA"
317	1-570-985-11	s	SWITCH, TOGGLE "TALLY"
318	1-633-209-11	o	PRINTED CIRCUIT BOARD "CN-440"
319	1-633-206-11	o	PRINTED CIRCUIT BOARD "LP-54"
320	1-633-210-11	o	PRINTED CIRCUIT BOARD "SW-425"
321	1-940-868-11	s	HARNESS (VF CABLE)
322	2-277-457-00	s	KNOB, STOPPER
323	2-277-466-01	s	SPRING, COMPRESSION
324	3-335-207-01	s	SHAFT, MOTOR
325	3-657-654-00	o	RING, ORNAMENTAL
326	3-672-241-00	o	RING (B), SLEEVE
327	3-734-760-01	o	RING
328	3-680-595-01	o	SUPPORT, ROTARY
329	3-685-118-01	o	SPACER, RING
330	3-685-129-01	o	SPRING (N), LEAF, VF
331	3-707-587-01	s	SCREEN ASSY, WIND
332	3-710-007-02	s	GUIDE, VF SLIDE
333	3-710-008-02	s	HOUSING, STOPPER
334	3-715-342-02	o	GUARD, CONNECTOR
335	3-742-205-01	o	BRACKET, CN
336	3-725-279-01	o	PACKING (VR), DROP PROTECTION
337	3-720-946-01	o	PIN, MICROPHONE STOPPER
338	3-720-954-02	o	LABEL, SW, VR
339	3-685-104-01	s	NUT (M6), CONTROL
340	3-742-242-01	o	PLATE (B), DISPLAY
341	3-720-970-01	s	PLATE (A), LIGHT INTERCEPTION
342	3-720-974-04	o	BRACKET (2), PC BOARD
343	3-720-977-01	s	PACKING (A), DROP PROTECTION
344	3-720-978-01	s	PACKING (B), DROP PROTECTION
345	3-720-997-02	s	PLATE, LIGHT INTERCEPTION
346	3-722-475-04	o	COVER (A)
347	3-722-476-01	o	NUT, PLATE
349	3-722-478-01	s	RING, O
350	3-722-479-01	o	GUIDE, TUBE
351	3-722-480-01	o	RING
352	3-722-481-04	o	HOLDER, PC BOARD
353	3-722-482-03	o	RETAINER, RING
354	3-722-485-01	o	ROLLER, SLIDE
355	3-722-486-01	s	KNOB
356	3-722-489-01	o	GUIDE, ROLLER
357	3-722-492-01	o	HOLDER, (B) LENS
358	3-722-494-01	o	BRACKET, VR SW
359	3-722-497-01	o	TUBE
360	3-723-001-02	o	TUBE, VF
361	3-723-002-12	o	VF (MAIN)
362	3-723-069-02	o	PROTECTOR, MC
363	3-729-099-01	o	MIRROR
364	3-723-073-01	o	CUSHION, MIRROR
365	3-723-075-01	o	RING, FILTER
366	3-742-001-01	o	HOLDER (2), MIRROR
367	3-723-077-01	o	RING, ADJUSTMENT
368	3-723-079-01	s	EYE CUP
369	3-724-744-03	o	WASHER
371	3-724-746-01	o	SHEET (B), INSULATING
372	3-725-220-02	o	TUBE (A), CRT
373	3-725-221-04	o	TUBE (B), CRT
374	3-725-222-04	o	PACKING, RING
375	3-725-257-01	o	BOSS
376	3-725-258-03	o	STOPPER, ROTARY
377	3-725-277-01	s	KNOB (B)
378	3-725-278-01	s	PACKING (SW), DROP PROTECTION
379	3-725-280-01	s	PACKING (A), DROP PROTECTION
380	3-725-282-03	o	HINGE, PC BOARD
381	2-115-882-01	o	RING
382	3-729-062-01	o	SPACER, MASK
383	3-729-701-21	o	RUBBER, (CARBON), CONDUCTIVE
384	3-734-739-01	o	SHEET, INSULATING, MASK
385	3-734-740-01	o	SUPPORT
387	3-722-474-05	s	BRACKET, LP
388	1-633-208-11	o	PRINTED CIRCUIT BOARD "LP-56"
389	1-633-207-11	o	PRINTED CIRCUIT BOARD "LP-55"
390	3-672-250-01	o	RING, O (M2.6)
391	7-627-556-57	s	SCREW + P2.6x5 Ser No. 10221 - 11060 (UC) 30356 - 31100 (J) 40386 - 41075 (EK)
	3-165-162-00	s	SCREW (2.6x5) (TYPY1) Ser No, 11061 - (UC) 31101 - (J) 41076 - (EK)
392	3-166-307-01	o	PLATE, SHILD

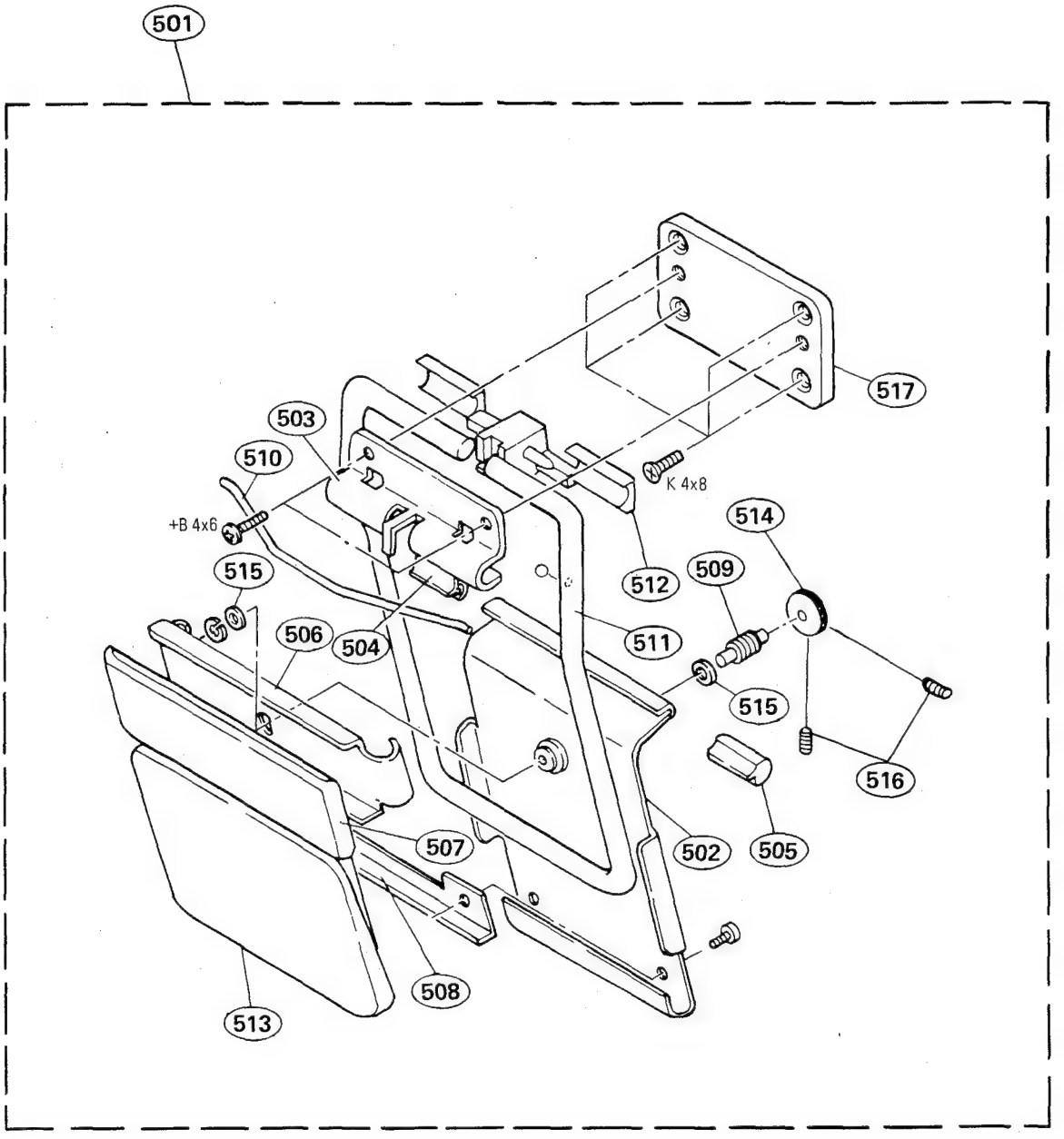
VCT-14

No.	Parts No.	SP	Description
401	2-381-631-01	o	SPRING
402	2-381-632-01	o	ARM, LOCKER
403	2-381-633-01	o	SOLENOID
404	2-381-635-01	o	LEVER, LOCK
405	2-381-636-01	o	KNOB
406	2-381-637-01	o	SPRING
407	2-381-638-01	o	SPRING
408	2-381-640-01	o	DOG
409	2-381-641-01	o	COLLAR
410	2-381-642-02	o	MOUNT
411	2-381-648-01	o	INSULATOR, KNOB
412	2-381-652-01	o	SPRING, TENSION
413	2-381-654-01	o	PIN, SPRING
414	3-678-704-00	o	SPACER
415	3-720-906-01	o	LID (S), REAR
416	3-720-907-01	o	PIN (S), REAR
417	3-720-908-01	o	TABLE (S), PIN, REAR
418	3-720-909-01	o	KNOB, CRANK
419	3-720-910-01	o	SHEET, SLIDE
420	3-720-911-01	o	BASE, TRIPOD FITTING SCREW
421	3-720-912-01	o	FRAME (S)
422	OPTIONAL ACCESSARY: TRIPOD ADAPTOR "VCT-14"		

TRIPOD ADAPTOR



PAD ASSY

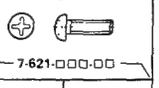

501
517
503
510
+B 4x6
K 4x8
514
515
512
509
506
504
511
515
516
507
502
505
508
513

PAD ASSY

No.	Part No.	SP	Description
501	A-7401-157-A	s	PAD ASSY (2)
502	X-3678-615-2	o	SUPPORT ASSY, PAD
503	3-680-507-00	o	BTACKET (A), STAY
504	3-680-508-00	o	PAD (A), STOPPER
505	3-680-509-00	o	PAD (B), STOPPER
506	3-680-510-00	o	BRACKET, STAY
507	3-680-511-03	o	PAD (B)
508	3-680-512-00	o	CLAMP, STAY
509	3-680-515-00	o	SCREW, STAY ADJUST
510	3-680-517-00	o	SPRING
511	3-680-518-00	o	STAY, PAD
512	3-680-519-00	o	SUPPORT, STAY
513	3-680-520-03	o	PAD (A)
514	3-680-533-00	o	KNOB, ADJUSTMENT
515	3-701-441-21	s	WASHER
516	3-701-505-00	s	SET SCREW, DOUBLE POINT 3X3
517	3-720-999-01	s	SPACER (2), SHOULDER

SCREWS

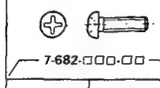
+B
Bzn-N



7-621-□□□-□□

SIZE	Parts No.
2 x 3	772-00
x 4	772-10
x 5	772-20
x 6	772-30
x 8	772-40
x 10	772-50
x 12	772-60
x 14	772-70
x 16	772-80
x 20	–
2.6 x 3	775-00
x 4	775-10
x 5	775-20
x 6	773-95
x 8	775-40
x 10	775-50
x 12	775-60
x 14	775-70
x 16	775-80
x 20	775-90

+B
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
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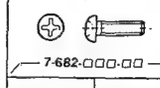
x 4	545-09
x 5	546-09
x 6	547-09
x 8	548-09
x 10	549-09
x 12	550-09
x 14	551-09
x 16	552-09
x 20	553-09
x 30	555-09
4 x 4	558-09
x 5	559-09
x 6	560-09
x 8	561-09
x 10	562-09
x 12	563-09
x 14	564-09
x 16	565-09
x 20	566-09
5 x 8	574-09
x 10	575-09
x 12	576-09
x 14	577-09
x 16	578-09
x 20	579-09

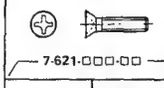
+B
Cr-N



7-682-□□□-□□

SIZE	Parts No.
3 x 3	544-04
x 4	545-04
x 5	546-04
x 6	547-04
x 8	548-04
x 10	549-04
x 12	550-04
x 14	551-04
x 16	552-04
x 20	553-04
4 x 4	558-04
x 5	559-04
x 6	560-04
x 8	561-04
x 10	562-04
x 12	563-04
x 14	564-04
x 16	565-04
x 20	566-04
5 x 8	574-04
x 10	575-04
x 12	576-04
x 14	577-04
x 16	578-04
x 20	579-04

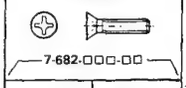
+K
Bzn-N



7-621-□□□-□□

SIZE	Parts No.
2 x 3	555-10
x 4	591-00
x 5	555-30
x 6	555-40
x 8	555-50
x 10	555-60
x 12	555-70
x 14	–
x 16	–
x 20	–
2.6 x 4	559-20
x 5	559-30
x 6	592-00
x 8	592-10
x 10	592-20
x 12	592-30
x 14	559-00
x 16	560-00
x 20	560-20

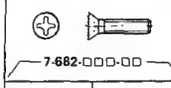
+K
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
3 x 4	245-09
x 5	246-09
x 6	247-09
x 8	248-09
x 10	249-09
x 12	250-09
x 14	251-09
x 16	252-09
x 20	253-09
4 x 6	260-09
x 8	261-09
x 10	262-09
x 12	263-09
x 14	264-09
x 16	265-09
x 20	266-09

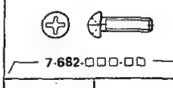
+K
Cr-N



7-682-□□□-□□

SIZE	Parts No.
3 x 4	245-04
x 5	246-04
x 6	247-04
x 8	248-04
x 10	249-04
x 12	250-04
x 14	251-04
x 16	252-04
x 20	253-04
4 x 6	260-04
x 8	261-04
x 10	262-04
x 12	263-04
x 14	264-04
x 16	265-04
x 20	266-04

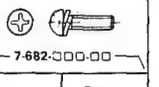
+P
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
3 x 3	144-09
x 4	145-09
x 5	146-09
x 6	147-09
x 8	148-09
x 10	149-09
x 12	150-09
x 14	151-09
4 x 4	158-09
x 5	159-09
x 6	160-09
x 8	161-09
x 10	162-09
x 12	163-09
x 14	164-09
x 16	165-09
x 20	166-09

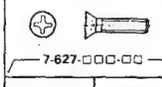
+PS
Bzn-N



7-682-□□□-□□

SIZE	Parts No.
2 x 4	253-00
x 5	253-10
x 6	253-20
x 8	253-30
x 10	253-40
x 12	253-50
2.6 x 4	253-90
x 5	254-00
x 6	254-10
x 8	254-20
x 10	254-30
x 12	254-40
x 14	254-90
x 16	254-50
x 20	254-60
3 x 5	646-09
x 6	647-09
x 8	648-09
x 10	649-09
x 12	650-09
x 14	651-09
x 16	652-09
x 20	–
4 x 6	–
x 8	–
x 10	–
x 12	–
x 14	–
x 16	–
x 20	–

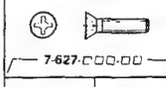
PRECISION +K
Bzn-N



7-627-□□□-□□

SIZE	Parts No.
1.7 x 1.8	–
x 2	450-28
x 2.2	–
x 2.5	450-48
x 2.8	–
x 3	450-58
x 3.5	–
x 4	450-78
x 4.5	–
x 5	450-98
x 5.5	–
x 6	–
2 x 2	452-08
x 2.2	452-88
x 2.5	452-48
x 2.8	–
x 3	452-18
x 3.5	452-98
x 4	452-28
x 4.5	–
x 5	452-38
x 5.5	–
x 6	452-58
x 7	452-68
x 8	452-78
2.6 x 3.5	–
x 4	–
x 4.5	454-28
x 5	454-38
x 5.5	–
x 6	–
x 7	–
x 8	–

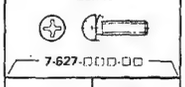
PRECISION +K
Cr-N



7-627-□□□-□□

SIZE	Parts No.
1.7 x 1.8	–
x 2	–
x 2.2	–
x 2.5	–
x 2.8	–
x 3	–
x 3.5	–
x 4	–
x 4.5	–
x 5	–
x 5.5	–
x 6	–
2 x 2	452-07
x 2.2	452-87
x 2.5	–
x 2.8	–
x 3	452-17
x 3.5	–
x 4	452-27
x 4.5	–
x 5	–
x 5.5	–
x 6	–
x 7	452-67
x 8	–
2.6 x 3.5	–
x 4	454-17
x 4.5	–
x 5	454-37
x 5.5	–
x 6	–
x 7	–
x 8	–

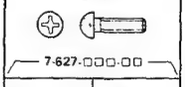
PRECISION +P
Bzn-N



7-627-□□□-□□

SIZE	Parts No.
1.7 x 1.6	552-18
x 1.8	–
x 2	552-28
x 2.2	–
x 2.5	552-08
x 2.8	–
x 3	552-38
x 3.5	552-78
x 4	552-48
x 4.5	–
x 5	552-58
x 5.5	–
x 6	–
2 x 1.8	554-38
x 2	553-18
x 2.2	–
x 2.5	553-28
x 2.8	554-58
x 3	553-38
x 3.5	554-18
x 4	553-48
x 4.5	553-58
x 5	554-28
x 5.5	–
x 6	553-68
x 7	553-88
x 8	553-98
x 10	553-78
2.6 x 2.8	556-08
x 3	–
x 3.5	556-28
x 4	556-38
x 4.5	556-48
x 5	556-58
x 5.5	–
x 6	556-78
x 7	–
x 8	–
x 9	–
x 10	–

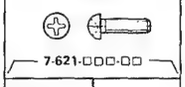
PRECISION +P
Cr-N



7-627-□□□-□□

SIZE	Parts No.
1.7 x 1.6	–
x 1.8	–
x 2	552-27
x 2.2	552-87
x 2.5	552-07
x 2.8	–
x 3	552-37
x 3.5	–
x 4	552-47
x 4.5	552-67
x 5	552-57
x 5.5	557-07
x 6	552-77
2 x 1.8	554-37
x 2	553-17
x 2.2	554-07
x 2.5	553-27
x 2.8	–
x 3	553-37
x 3.5	554-17
x 4	553-47
x 4.5	553-57
x 5	553-67
x 5.5	–
x 6	554-27
x 7	553-87
x 8	553-97
x 10	553-77
2.6 x 2.8	556-07
x 3	–
x 3.5	–
x 4	556-37
x 4.5	–
x 5	556-57
x 5.5	–
x 6	556-77
x 7	–
x 8	556-97
x 9	–
x 10	557-47

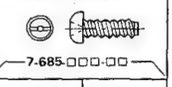
+P
Bzn-N



7-621-□□□-□□

SIZE	Parts No.
2 x 3	255-10
x 4	255-20
x 5	283-00
x 6	255-40
x 8	255-50
x 10	283-10
x 12	283-70
x 14	–
x 16	–
x 20	256-20
2.3 x 5	–
x 6	–
x 8	–
x 10	–
x 12	–
x 14	–
x 16	–
x 20	–
2.6 x 3	259-10
x 4	284-00
x 5	284-10
x 6	284-20
x 8	284-30
x 10	284-40
x 12	259-70
x 14	259-80
x 16	260-00
x 20	260-20

TOTSU P
BZn-N NON SLIT



7-685-□□□-□□

SIZE	Parts No.
2 x 4	102-19
2 x 5	103-19
2 x 6	104-19
2 x 8	105-19
2 x 10	106-19
2 x 12	107-19
2.6 x 4	131-19
2.6 x 5	132-19
2.6 x 6	133-19
2.6 x 8	134-19
2.6 x 10	135-19
2.6 x 12	136-19
2.6 x 14	137-19
2.6 x 16	138-19
3 x 5	144-19
3 x 6	145-19
3 x 8	146-19
3 x 10	147-19
3 x 12	148-19
3 x 14	149-19
3 x 16	150-19
3 x 18	
3 x 20	151-19
3 x 25	152-19
3 x 30	153-19
3 x 35	154-19
3 x 40	155-19
3 x 58	
4 x 6	158-19
4 x 8	159-19
4 x 10	160-19
4 x 12	161-19
4 x 14	162-19
4 x 16	163-19
4 x 20	164-19
4 x 25	165-19
4 x 30	166-19
4 x 35	167-19

CAPACITOR, ELECTROLYTIC

Part No.	SP	Description
1-124-463-11	s	CAP, ELECT 0.1 20% 50V
1-124-464-11	s	CAP, ELECT 0.22 20% 50V
1-124-252-11	s	CAP, ELECT 0.33 20% 50V
1-124-465-21	s	CAP, ELECT 0.47 20% 50V
1-124-438-11	s	CAP, ELECT 1.0 20% 50V
1-124-257-11	s	CAP, ELECT 2.2 20% 50V
1-126-162-11	s	CAP, ELECT 3.3 20% 50V
1-124-245-11	s	CAP, ELECT 4.7 20% 35V
1-124-259-11	s	CAP, ELECT 4.7 20% 50V
1-126-157-11	s	CAP, ELECT 10 20% 10V
1-124-233-11	s	CAP, ELECT 10 20% 16V
1-126-247-11	s	CAP, ELECT 10 20% 35V
1-124-261-11	s	CAP, ELECT 10 20% 50V
1-126-153-11	s	CAP, ELECT 22 20% 6.3V
1-124-234-00	s	CAP, ELECT 22 20% 10V
1-124-248-11	s	CAP, ELECT 22 20% 35V
1-124-431-11	s	CAP, ELECT 33 20% 4V
1-124-229-00	s	CAP, ELECT 33 20% 10V
1-124-242-00	s	CAP, ELECT 33 20% 25V
1-126-154-11	s	CAP, ELECT 47 20% 6.3V
1-124-589-11	s	CAP, ELECT 47 20% 16V
1-124-584-11	s	CAP, ELECT 100 20% 10V

CAPACITOR, TANTALUM

Part No.	SP	Description
1-131-396-00	s	CAP, TANTALUM 0.01 20% 35V
1-131-397-00	s	CAP, TANTALUM 0.015 20% 35V
1-131-398-00	s	CAP, TANTALUM 0.022 20% 35V
1-131-399-00	s	CAP, TANTALUM 0.033 20% 35V
1-131-400-00	s	CAP, TANTALUM 0.047 20% 35V
1-131-401-00	s	CAP, TANTALUM 0.068 10% 35V
1-131-341-00	s	CAP, TANTALUM 0.1 10% 35V
1-131-342-00	s	CAP, TANTALUM 0.15 10% 35V
1-131-343-00	s	CAP, TANTALUM 0.22 10% 35V
1-131-344-00	s	CAP, TANTALUM 0.33 10% 35V
1-131-412-00	s	CAP, TANTALUM 0.47 20% 20V
1-131-345-00	s	CAP, TANTALUM 0.47 10% 35V
1-131-410-00	s	CAP, TANTALUM 0.68 20% 25V
1-131-346-00	s	CAP, TANTALUM 0.68 10% 35V
1-131-413-00	s	CAP, TANTALUM 1.0 20% 20V
1-131-347-00	s	CAP, TANTALUM 1.0 10% 35V
1-131-416-00	s	CAP, TANTALUM 1.5 20% 16V
1-131-348-00	s	CAP, TANTALUM 1.5 10% 35V
1-131-419-00	s	CAP, TANTALUM 2.2 20% 10V
1-131-361-00	s	CAP, TANTALUM 2.2 10% 20V
1-131-349-00	s	CAP, TANTALUM 2.2 10% 35V
1-131-422-00	s	CAP, TANTALUM 3.3 20% 6.3V
1-131-368-00	s	CAP, TANTALUM 3.3 10% 16V
1-131-356-00	s	CAP, TANTALUM 3.3 10% 25V
1-131-350-00	s	CAP, TANTALUM 3.3 10% 35V
1-131-425-00	s	CAP, TANTALUM 4.7 20% 3.15V
1-131-375-00	s	CAP, TANTALUM 4.7 10% 10V
1-131-363-00	s	CAP, TANTALUM 4.7 10% 20V
1-131-351-00	s	CAP, TANTALUM 4.7 10% 35V
1-131-382-00	s	CAP, TANTALUM 6.8 10% 6.3V
1-131-370-00	s	CAP, TANTALUM 6.8 10% 16V
1-131-358-00	s	CAP, TANTALUM 6.8 10% 25V
1-131-352-00	s	CAP, TANTALUM 6.8 10% 35V
1-131-389-00	s	CAP, TANTALUM 10 10% 3.15V
1-131-377-00	s	CAP, TANTALUM 10 10% 10V
1-131-365-00	s	CAP, TANTALUM 10 10% 20V
1-131-353-00	s	CAP, TANTALUM 10 10% 35V
1-131-384-00	s	CAP, TANTALUM 15 10% 6.3V
1-131-372-00	s	CAP, TANTALUM 15 10% 16V
1-131-360-00	s	CAP, TANTALUM 15 10% 25V
1-131-391-00	s	CAP, TANTALUM 22 10% 3.15V
1-131-379-00	s	CAP, TANTALUM 22 10% 10V
1-131-367-00	s	CAP, TANTALUM 22 10% 20V
1-131-386-00	s	CAP, TANTALUM 33 10% 6.3V
1-131-374-00	s	CAP, TANTALUM 33 10% 16V
1-131-393-00	s	CAP, TANTALUM 47 10% 3.15V
1-131-381-00	s	CAP, TANTALUM 47 10% 10V
1-131-388-00	s	CAP, TANTALUM 68 10% 6.3V
1-131-395-00	s	CAP, TANTALUM 100 10% 3.15V

RESISTOR, CHIP

Part No.	SP	Description
1-216-295-00	s	RES, CHIP 0 5% 1/10W
1-216-298-00	s	RES, CHIP 2.2 5% 1/10W
1-216-302-00	s	RES, CHIP 2.7 5% 1/10W
1-216-304-00	s	RES, CHIP 3.3 5% 1/10W
1-216-306-00	s	RES, CHIP 3.9 5% 1/10W
1-216-308-00	s	RES, CHIP 4.7 5% 1/10W
1-216-309-00	s	RES, CHIP 5.6 5% 1/10W
1-216-311-00	s	RES, CHIP 6.8 5% 1/10W
1-216-313-00	s	RES, CHIP 8.2 5% 1/10W
1-216-001-00	s	RES, CHIP 10 5% 1/10W
1-216-003-00	s	RES, CHIP 12 5% 1/10W
1-216-005-00	s	RES, CHIP 15 5% 1/10W
1-216-007-00	s	RES, CHIP 18 5% 1/10W
1-216-009-00	s	RES, CHIP 22 5% 1/10W
1-216-011-00	s	RES, CHIP 27 5% 1/10W
1-216-013-00	s	RES, CHIP 33 5% 1/10W
1-216-015-00	s	RES, CHIP 39 5% 1/10W
1-216-017-00	s	RES, CHIP 47 5% 1/10W
1-216-019-00	s	RES, CHIP 56 5% 1/10W
1-216-021-00	s	RES, CHIP 68 5% 1/10W
1-216-023-00	s	RES, CHIP 82 5% 1/10W
1-216-025-00	s	RES, CHIP 100 5% 1/10W
1-216-027-00	s	RES, CHIP 120 5% 1/10W
1-216-029-00	s	RES, CHIP 150 5% 1/10W
1-216-031-00	s	RES, CHIP 180 5% 1/10W
1-216-033-00	s	RES, CHIP 220 5% 1/10W
1-216-035-00	s	RES, CHIP 270 5% 1/10W
1-216-037-00	s	RES, CHIP 330 5% 1/10W
1-216-039-00	s	RES, CHIP 390 5% 1/10W
1-216-041-00	s	RES, CHIP 470 5% 1/10W
1-216-043-00	s	RES, CHIP 560 5% 1/10W
1-216-045-00	s	RES, CHIP 680 5% 1/10W
1-216-047-00	s	RES, CHIP 820 5% 1/10W
1-216-049-00	s	RES, CHIP 1k 5% 1/10W
1-216-051-00	s	RES, CHIP 1.2k 5% 1/10W
1-216-053-00	s	RES, CHIP 1.5k 5% 1/10W
1-216-055-00	s	RES, CHIP 1.8k 5% 1/10W
1-216-057-00	s	RES, CHIP 2.2k 5% 1/10W
1-216-059-00	s	RES, CHIP 2.7k 5% 1/10W
1-216-061-00	s	RES, CHIP 3.3k 5% 1/10W
1-216-063-00	s	RES, CHIP 3.9k 5% 1/10W
1-216-065-00	s	RES, CHIP 4.7k 5% 1/10W
1-216-067-00	s	RES, CHIP 5.6k 5% 1/10W
1-216-069-00	s	RES, CHIP 6.8k 5% 1/10W
1-216-071-00	s	RES, CHIP 8.2k 5% 1/10W
1-216-073-00	s	RES, CHIP 10k 5% 1/10W
1-216-075-00	s	RES, CHIP 12k 5% 1/10W
1-216-077-00	s	RES, CHIP 15k 5% 1/10W
1-216-079-00	s	RES, CHIP 18k 5% 1/10W
1-216-081-00	s	RES, CHIP 22k 5% 1/10W
1-216-083-00	s	RES, CHIP 27k 5% 1/10W
1-216-085-00	s	RES, CHIP 33k 5% 1/10W
1-216-087-00	s	RES, CHIP 39k 5% 1/10W
1-216-089-00	s	RES, CHIP 47k 5% 1/10W
1-216-091-00	s	RES, CHIP 56k 5% 1/10W

RESISTOR, CHIP

Part No.	SP	Description
1-216-093-00	s	RES, CHIP 68k 5% 1/10W
1-216-095-00	s	RES, CHIP 82k 5% 1/10W
1-216-097-00	s	RES, CHIP 100k 5% 1/10W
1-216-099-00	s	RES, CHIP 120k 5% 1/10W
1-216-101-00	s	RES, CHIP 150k 5% 1/10W
1-216-103-00	s	RES, CHIP 180k 5% 1/10W
1-216-105-00	s	RES, CHIP 220k 5% 1/10W
1-216-107-00	s	RES, CHIP 270k 5% 1/10W
1-216-109-00	s	RES, CHIP 330k 5% 1/10W
1-216-111-00	s	RES, CHIP 390k 5% 1/10W
1-216-113-00	s	RES, CHIP 470k 5% 1/10W
1-216-115-00	s	RES, CHIP 560k 5% 1/10W
1-216-117-00	s	RES, CHIP 680k 5% 1/10W
1-216-119-00	s	RES, CHIP 820k 5% 1/10W
1-216-121-00	s	RES, CHIP 1.0M 5% 1/10W
1-216-123-00	s	RES, CHIP 1.2M 5% 1/10W
1-216-125-00	s	RES, CHIP 1.5M 5% 1/10W
1-216-127-00	s	RES, CHIP 1.8M 5% 1/10W
1-216-129-00	s	RES, CHIP 2.2M 5% 1/10W
1-216-131-00	s	RES, CHIP 2.7M 5% 1/10W
1-216-133-00	s	RES, CHIP 3.3M 5% 1/10W

RESISTOR, METAL

Part No.	SP	Description
1-214-509-00	s	RES, METAL 10 1% 1/8W
1-214-510-00	s	RES, METAL 11 1% 1/8W
1-214-511-00	s	RES, METAL 12 1% 1/8W
1-214-512-00	s	RES, METAL 13 1% 1/8W
1-214-513-00	s	RES, METAL 15 1% 1/8W
1-214-514-00	s	RES, METAL 16 1% 1/8W
1-214-515-00	s	RES, METAL 18 1% 1/8W
1-214-516-00	s	RES, METAL 20 1% 1/8W
1-214-517-00	s	RES, METAL 22 1% 1/8W
1-214-518-00	s	RES, METAL 24 1% 1/8W
1-214-519-00	s	RES, METAL 27 1% 1/8W
1-214-520-00	s	RES, METAL 30 1% 1/8W
1-214-521-00	s	RES, METAL 33 1% 1/8W
1-214-522-00	s	RES, METAL 36 1% 1/8W
1-214-523-00	s	RES, METAL 39 1% 1/8W
1-214-524-00	s	RES, METAL 43 1% 1/8W
1-214-525-00	s	RES, METAL 47 1% 1/8W
1-214-526-00	s	RES, METAL 51 1% 1/8W
1-214-527-00	s	RES, METAL 56 1% 1/8W
1-214-528-00	s	RES, METAL 62 1% 1/8W
1-214-529-00	s	RES, METAL 68 1% 1/8W
1-214-530-00	s	RES, METAL 75 1% 1/8W
1-214-531-00	s	RES, METAL 82 1% 1/8W
1-214-532-00	s	RES, METAL 91 1% 1/8W
1-214-533-00	s	RES, METAL 100 1% 1/8W
1-214-534-00	s	RES, METAL 110 1% 1/8W
1-214-535-00	s	RES, METAL 120 1% 1/8W
1-214-536-00	s	RES, METAL 130 1% 1/8W
1-214-537-00	s	RES, METAL 150 1% 1/8W
1-214-538-00	s	RES, METAL 160 1% 1/8W
1-214-539-00	s	RES, METAL 180 1% 1/8W
1-214-540-00	s	RES, METAL 200 1% 1/8W
1-214-541-00	s	RES, METAL 220 1% 1/8W
1-214-542-00	s	RES, METAL 240 1% 1/8W
1-214-543-00	s	RES, METAL 270 1% 1/8W
1-214-544-00	s	RES, METAL 300 1% 1/8W
1-214-545-00	s	RES, METAL 330 1% 1/8W
1-214-546-00	s	RES, METAL 360 1% 1/8W
1-214-547-00	s	RES, METAL 390 1% 1/8W
1-214-548-00	s	RES, METAL 430 1% 1/8W
1-214-549-00	s	RES, METAL 470 1% 1/8W
1-214-550-00	s	RES, METAL 510 1% 1/8W
1-214-551-00	s	RES, METAL 560 1% 1/8W
1-214-552-00	s	RES, METAL 620 1% 1/8W
1-214-553-00	s	RES, METAL 680 1% 1/8W
1-214-554-00	s	RES, METAL 750 1% 1/8W
1-214-555-00	s	RES, METAL 820 1% 1/8W
1-214-556-00	s	RES, METAL 910 1% 1/8W
1-214-557-00	s	RES, METAL 1.0k 1% 1/8W
1-214-558-00	s	RES, METAL 1.1k 1% 1/8W
1-214-559-00	s	RES, METAL 1.2k 1% 1/8W
1-214-560-00	s	RES, METAL 1.3k 1% 1/8W
1-214-561-00	s	RES, METAL 1.5k 1% 1/8W
1-214-562-00	s	RES, METAL 1.6k 1% 1/8W
1-214-563-00	s	RES, METAL 1.8k 1% 1/8W

RESISTOR, METAL

Part No.	SP	Description
1-214-564-00	s	RES, METAL 2.0k 1% 1/8W
1-214-565-00	s	RES, METAL 2.2k 1% 1/8W
1-214-566-00	s	RES, METAL 2.4k 1% 1/8W
1-214-567-00	s	RES, METAL 2.7k 1% 1/8W
1-214-568-00	s	RES, METAL 3.0k 1% 1/8W
1-214-569-00	s	RES, METAL 3.3k 1% 1/8W
1-214-570-00	s	RES, METAL 3.6k 1% 1/8W
1-214-571-00	s	RES, METAL 3.9k 1% 1/8W
1-214-572-00	s	RES, METAL 4.3k 1% 1/8W
1-214-573-00	s	RES, METAL 4.7k 1% 1/8W
1-214-574-00	s	RES, METAL 5.1k 1% 1/8W
1-214-575-00	s	RES, METAL 5.6k 1% 1/8W
1-214-576-00	s	RES, METAL 6.2k 1% 1/8W
1-214-577-00	s	RES, METAL 6.8k 1% 1/8W
1-214-578-00	s	RES, METAL 7.5k 1% 1/8W
1-214-579-00	s	RES, METAL 8.2k 1% 1/8W
1-214-580-00	s	RES, METAL 9.1k 1% 1/8W
1-214-581-00	s	RES, METAL 10k 1% 1/8W
1-214-582-00	s	RES, METAL 11k 1% 1/8W
1-214-583-00	s	RES, METAL 12k 1% 1/8W
1-214-584-00	s	RES, METAL 13k 1% 1/8W
1-214-585-00	s	RES, METAL 15k 1% 1/8W
1-214-586-00	s	RES, METAL 16k 1% 1/8W
1-214-587-00	s	RES, METAL 18k 1% 1/8W
1-214-588-00	s	RES, METAL 20k 1% 1/8W
1-214-589-00	s	RES, METAL 22k 1% 1/8W
1-214-590-00	s	RES, METAL 24k 1% 1/8W
1-214-591-00	s	RES, METAL 27k 1% 1/8W
1-214-592-00	s	RES, METAL 30k 1% 1/8W
1-214-593-00	s	RES, METAL 33k 1% 1/8W
1-215-819-11	s	RES, METAL 36k 1% 1/8W
1-215-820-11	s	RES, METAL 39k 1% 1/8W
1-215-821-11	s	RES, METAL 43k 1% 1/8W
1-215-822-11	s	RES, METAL 47k 1% 1/8W
1-215-823-11	s	RES, METAL 51k 1% 1/8W
1-215-824-11	s	RES, METAL 56k 1% 1/8W
1-215-825-11	s	RES, METAL 62k 1% 1/8W
1-215-826-11	s	RES, METAL 68k 1% 1/8W
1-215-827-11	s	RES, METAL 75k 1% 1/8W
1-215-828-11	s	RES, METAL 82k 1% 1/8W
1-215-829-11	s	RES, METAL 91k 1% 1/8W
1-215-830-11	s	RES, METAL 100k 1% 1/8W

AT-58 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7515-127-A	o	MOUNTED CIRCUIT BOARD, AT-58
5pcs	3-621-124-00	o	SPACER
4pcs	3-669-595-00	s	WASHER (2), STOPPER
2pcs	3-711-767-01	s	SCREW, STOPPER
C1	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C3	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C11	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
C17	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C18	1-125-446-11	s	DOUBLE LAYERS 0.47F 5.5V
C20	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C22	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C23	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C25	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C26	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C27	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C30	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C35	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C36	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C37	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C39	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C40	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C42	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C43	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C44	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C45	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C46	1-102-074-00	s	CERAMIC 0.001MF 10% 50V
CN1	1-506-731-21	o	CONNECTOR, 40P MALE
CN2	1-506-467-11	o	CONNECTOR, 2P, MALE
CN3	1-506-471-11	o	CONNECTOR, 6P, MALE
CN4	1-506-468-11	o	CONNECTOR, 3P, MALE
CN5	1-506-473-11	o	CONNECTOR, 8P, MALE
CN6	1-506-467-11	o	CONNECTOR, 2P, MALE
CN7	1-506-469-11	o	CONNECTOR, 4P, MALE
D1	8-719-400-18	s	DIODE MA152WK
D2	8-719-104-34	s	DIODE 1S2836
D3	8-719-400-18	s	DIODE MA152WK
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-104-34	s	DIODE 1S2836
IC1	1-807-412-12	s	IC BH-1219A
IC2	1-807-413-11	s	IC BH-1220
IC3	1-807-414-11	s	IC BH-1221
IC4	8-759-200-82	s	IC TC4069UBF
IC5	8-759-906-54	s	IC TL064CNS
IC6	8-759-208-07	s	IC TC4051BFHB
IC7	8-759-101-12	s	IC UPC311G2
IC8	8-759-918-65	s	IC TL7700CPS
IC9	8-759-204-79	s	IC TC40H241F
IC10	8-759-906-53	s	IC TL062CPS

(AT-58 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
IC11	8-759-400-89	s	IC MN1237AD
IC12	8-741-117-90	s	IC BX1179
IC13	8-759-200-82	s	IC TC4069UBF
IC14	8-759-320-07	s	IC HD63PB05Y0
IC15	8-759-736-90	s	IC MBM27C64
IC16	8-741-117-90	s	IC BX1179
IC17	8-759-234-77	s	IC TC4S66F
IC18	8-759-209-69	s	IC TC4S11F
Q1	8-729-100-66	s	TRANSISTOR 2SC1623
Q2	8-729-216-22	s	TRANSISTOR 2SA1162
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-100-66	s	TRANSISTOR 2SC1623
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q6	8-729-216-22	s	TRANSISTOR 2SA1162
Q7	8-729-100-66	s	TRANSISTOR 2SC1623
R39	1-216-686-11	s	METAL CHIP 30K 0.5% 1/10W
R41	1-216-691-11	s	METAL CHIP 47K 0.5% 1/10W
R52	1-216-626-11	s	METAL CHIP 91 0.50% 1/10W
R53	1-216-682-11	s	METAL CHIP 20K 0.5% 1/10W
R54	1-216-693-11	s	METAL CHIP 56K 0.5% 1/10W
R73	1-216-639-11	s	METAL CHIP 330 0.5% 1/10W
R74	1-216-627-11	s	METAL CHIP 100 0.5% 1/10W
R75	1-216-627-11	s	METAL CHIP 100 0.5% 1/10W
R76	1-216-627-11	s	METAL CHIP 100 0.5% 1/10W
R77	1-216-693-11	s	METAL CHIP 56K 0.5% 1/10W
R78	1-216-655-11	s	METAL CHIP 1.5K 0.5% 1/10W
RP1	1-235-813-11	s	NETWORK
RP2	1-235-813-11	s	NETWORK
RP3	1-231-387-00	s	NETTY, RES
RV1	1-237-035-11	s	METAL 5K
RV2	1-237-034-11	s	METAL 2K
S1	1-570-602-11	s	SWITCH, DIP
S2	1-570-374-12	s	SLIDE
X1	1-567-192-11	s	CERAMIC 4.00MHz

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

BI-29 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C2	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C3	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C4	1-126-767-11	s	ELECT 1000uF 20% 16V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C7	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C8	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C9	1-163-129-00	s	CERAMIC CHIP 330PF 5% 50V
C10	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C11	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-126-767-11	s	ELECT 1000uF 20% 16V
CN1	1-943-989-11	s	HARNESS(BI HARNESS 70)
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
	1-566-987-11	o	CONTACT, MALE AWG28-32
	1-568-655-11	o	HOUSING, 10P
CN2	1-943-989-11	s	HARNESS(BI HARNESS 70)
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
	1-566-987-11	o	CONTACT, MALE AWG28-32
	1-568-655-11	o	HOUSING, 10P
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-105-99	s	DIODE RD6.2M-B1
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-100-03	s	DIODE 1S2835
D5	8-719-800-76	s	DIODE 1SS123
Q1	8-729-421-71	s	TRANSISTOR 2SK620
Q2	8-729-116-64	s	TRANSISTOR 2SK508-K51
R13	1-216-688-11	s	METAL CHIP 36K 0.50% 1/10W

BI-30 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C2	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C3	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C4	1-126-767-11	s	ELECT 1000uF 20% 16V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C7	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C8	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C9	1-163-129-00	s	CERAMIC CHIP 330PF 5% 50V
C10	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C11	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-126-767-11	s	ELECT 1000uF 20% 16V
CN1	1-943-989-11	s	HARNESS(BI HARNESS 70)
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
	1-566-987-11	o	CONTACT, MALE AWG28-32
	1-568-655-11	o	HOUSING, 10P
CN2	1-943-989-11	s	HARNESS(BI HARNESS 70)
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
	1-566-987-11	o	CONTACT, MALE AWG28-32
	1-568-655-11	o	HOUSING, 10P
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-105-99	s	DIODE RD6.2M-B1
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-100-03	s	DIODE 1S2835
D5	8-719-800-76	s	DIODE 1SS123
Q1	8-729-421-71	s	TRANSISTOR 2SK620
Q2	8-729-116-64	s	TRANSISTOR 2SK508-K51
R13	1-216-688-11	s	METAL CHIP 36K 0.50% 1/10W

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

BI-31 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C2	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C3	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C4	1-126-767-11	s	ELECT 1000uF 20% 16V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C7	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C8	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C9	1-163-129-00	s	CERAMIC CHIP 330PF 5% 50V
C10	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C11	1-135-079-21	s	TANTALUM CHIP 3.3MF 20% 35V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-126-767-11	s	ELECT 1000uF 20% 16V
CN1	1-943-989-11	s	HARNESS (BI HARNESS 70)
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
	1-566-987-11	o	CONTACT, MALE AWG28-32
	1-568-655-11	o	HOUSING, 10P
CN2	1-943-989-11	s	HARNESS (BI HARNESS 70)
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
	1-566-987-11	o	CONTACT, MALE AWG28-32
	1-568-655-11	o	HOUSING, 10P
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-105-99	s	DIODE RD6.2M-B1
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-100-03	s	DIODE 1S2835
D5	8-719-800-76	s	DIODE 1SS123
Q1	8-729-421-71	s	TRANSISTOR 2SK620
Q2	8-729-116-64	s	TRANSISTOR 2SK508-K51
R13	1-216-688-11	s	METAL CHIP 36K 0.50% 1/10W

CN-304 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-988-A	o	MOUNTED CIRCUIT BOARD, CN-304
C1	1-135-166-21	s	TANTALUM CHIP 47MF 20% 6.3V
C2	1-135-166-21	s	TANTALUM CHIP 47MF 20% 6.3V
CN1	1-562-773-11	o	CONNECTOR, 40P, FEMALE
CN2	1-565-157-11	o	CONNECTOR, 10P, MALE
CN3	1-565-157-11	o	CONNECTOR, 10P, MALE
CN4	1-565-157-11	o	CONNECTOR, 10P, MALE
CN5	1-565-157-11	o	CONNECTOR, 10P, MALE
CN6	1-565-157-11	o	CONNECTOR, 10P, MALE
CN7	1-565-157-11	o	CONNECTOR, 10P, MALE
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-800-76	s	DIODE 1SS123
D3	8-719-800-76	s	DIODE 1SS123
D4	8-719-800-76	s	DIODE 1SS123
D5	8-719-800-76	s	DIODE 1SS123
D6	8-719-800-76	s	DIODE 1SS123
IC1	8-759-321-75	s	IC HD74AC04P-R
IC2	8-759-321-75	s	IC HD74AC04P-R

CN-440 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-633-209-12	o	PRINTED CIRCUIT BOARD, CN-440
C1	1-135-160-21	s	TANTALUM CHIP 15uF 10% 16V
CN11	1-566-399-21	o	CONNECTOR, 18P, MALE
CN13	1-566-395-11	o	CONNECTOR, 10P, MALE
CN14	1-566-394-21	o	CONNECTOR, 8P, MALE
L1	1-408-127-41	s	INDUCTOR 68UH

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

DR-86 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C3	1-163-017-00	s	CERAMIC CHIP 0.0047MF 10% 50V
C4	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C5	1-163-017-00	s	CERAMIC CHIP 0.0047MF 10% 50V
C6	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C8	1-124-556-11	s	ELECT 2200uF 20% 16V
C9	1-126-176-11	s	ELECT 220MF 20% 10V
C10	1-124-556-11	s	ELECT 2200uF 20% 16V
C12	1-126-103-11	s	ELECT 470uF 20% 16V
C21	1-124-478-11	s	ELECT 100MF 20% 25V
C23	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C24	1-163-227-11	s	CERAMIC CHIP 10PF 5% 50V
C25	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C27	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C28	1-126-233-11	s	ELECT 22uF 20% 35V
C29	1-126-233-11	s	ELECT 22uF 20% 35V
C30	1-124-122-11	s	ELECT 100MF 20% 50V
C31	1-135-136-21	s	TANTALUM CHIP 6.8uF 10% 35V
C32	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C33	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C34	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C37	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C38	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C39	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C40	1-135-092-21	s	TANTALUM CHIP 3.3MF 20% 16V
C41	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
CN1	1-569-606-11	o	CONNECTOR, 40P, MALE
CN2	1-566-573-11	o	CONNECTOR, 25P, FEMALE
CN3	1-506-474-11	o	CONNECTOR, 9P, MALE
D1	8-719-100-03	s	DIODE 1S2835
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-100-03	s	DIODE 1S2835
D5	8-719-100-03	s	DIODE 1S2835
D6	8-719-100-03	s	DIODE 1S2835
D7	8-719-800-76	s	DIODE 1SS123
D9	8-719-100-03	s	DIODE 1S2835
D10	8-719-105-99	s	DIODE RD6.2M-B1
D11	8-719-100-03	s	DIODE 1S2835
D12	8-719-100-03	s	DIODE 1S2835
D13	8-719-100-03	s	DIODE 1S2835
D14	8-719-908-06	s	DIODE ERA81-005
D15	8-719-908-06	s	DIODE ERA81-005
IC2	8-759-926-48	s	IC SN74HC244NS
IC3	8-752-031-03	s	IC CXA1065M
IC4	8-752-031-03	s	IC CXA1065M
IC5	8-752-031-03	s	IC CXA1065M
IC6	8-752-031-03	s	IC CXA1065M
IC7	8-759-234-20	s	IC TC7S08F-TE85L
Q1	8-729-216-22	s	TRANSISTOR 2SA1162
Q2	8-729-100-66	s	TRANSISTOR 2SC1623
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-216-22	s	TRANSISTOR 2SA1162
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q6	8-729-216-22	s	TRANSISTOR 2SA1162
Q7	8-729-143-44	s	TRANSISTOR 2SA1463IK
Q8	8-729-119-59	s	TRANSISTOR 2SK612-Z
Q9	8-729-143-44	s	TRANSISTOR 2SA1463IK
Q10	8-729-119-59	s	TRANSISTOR 2SK612-Z

(DR-86 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q12	8-729-100-66	s	TRANSISTOR 2SC1623
Q14	8-729-112-65	s	TRANSISTOR 2SA1462
Q15	8-729-112-65	s	TRANSISTOR 2SA1462
Q19	8-729-122-63	s	TRANSISTOR 2SA1226
Q20	8-729-421-71	s	TRANSISTOR 2SK620
Q21	8-729-100-66	s	TRANSISTOR 2SC1623
Q22	8-729-100-66	s	TRANSISTOR 2SC1623
Q23	8-729-100-66	s	TRANSISTOR 2SC1623
Q24	8-729-100-66	s	TRANSISTOR 2SC1623
Q25	8-729-100-66	s	TRANSISTOR 2SC1623
Q26	8-729-100-66	s	TRANSISTOR 2SC1623
Q27	8-729-100-66	s	TRANSISTOR 2SC1623
R1	1-216-682-11	s	METAL CHIP 20K 0.50% 1/10W
R58	1-216-668-11	s	METAL CHIP 5.1K 0.50% 1/10W
R60	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
RV1	1-237-037-11	s	METAL 20K
RV2	1-237-037-11	s	METAL 20K
RV3	1-237-037-11	s	METAL 20K

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

EN-69P BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-619-B	o	MOUNTED CIRCUIT BOARD, EN-69P
9pcs	3-621-124-00	o	SPACER
1pc	3-711-775-01	o	LEVER, PULL
C3	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C4	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C9	1-107-042-00	s	MICA 2.2PF 0.5PF 500V
C10	1-107-040-00	s	MICA 1.5PF 0.5PF 500V
C13	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C16	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C19	1-162-876-11	s	CERAMIC 75PF 5% 50V
C20	1-107-075-00	s	MICA 39PF 5% 50V
C21	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C24	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C26	1-107-043-00	s	MICA 2.7PF 0.5PF 500V
C27	1-107-043-00	s	MICA 2.7PF 0.5PF 500V
C28	1-107-043-00	s	MICA 2.7PF 0.5PF 500V
C35	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C39	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C40	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C41	1-107-042-00	s	MICA 2.2PF 0.5PF 500V
C42	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C43	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C44	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C45	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C49	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C50	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C51	1-162-752-11	s	CERAMIC 91PF 5% 50V
C52	1-162-871-11	s	CERAMIC 47PF 5% 50V
C53	1-107-206-00	s	MICA 15PF 5% 500V
C54	1-162-876-11	s	CERAMIC 75PF 5% 50V
C57	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C59	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C60	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C65	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C66	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C69	1-162-710-11	s	CERAMIC 100PF 5% 50V
C70	1-162-720-11	s	CERAMIC 270PF 5% 50V
C74	1-124-286-00	s	ELECT(NONPOLAR) 33 20% 16V
C75	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C76	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C78	1-162-710-11	s	CERAMIC 100PF 5% 50V
C79	1-162-720-11	s	CERAMIC 270PF 5% 50V
C82	1-124-286-00	s	ELECT(NONPOLAR) 33 20% 16V
C83	1-124-584-00	s	ELECT 100MF 20% 10V
C84	1-124-584-00	s	ELECT 100MF 20% 10V
C88	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C90	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C91	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C92	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C94	1-124-292-00	s	ELECT 33MF 20% 6.3V
C95	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C98	1-107-042-00	s	MICA 2.2PF 0.5PF 500V
C99	1-163-109-00	s	CERAMIC CHIP 47PF 5% 50V

(EN-69P BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C100	1-163-097-00	s	CERAMIC CHIP 15PF 5% 50V
C101	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C102	1-107-158-00	s	MICA 30PF 5% 500V
C103	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C104	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
C105	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN1	1-506-730-11	o	CONNECTOR, 40P, MALE
CV1	1-141-298-11	s	CERAMIC TRIMMER 10P
D2	8-719-914-11	s	DIODE HZ4ALL
D3	8-719-800-76	s	DIODE 1SS123
D4	8-719-100-05	s	DIODE 1S2837
D5	8-719-100-05	s	DIODE 1S2837
DL1	1-415-483-11	s	338+7nS
FL1	1-235-181-00	s	BAND PASS 4.43MHz
IC1	8-759-200-81	s	IC TC4053BF
IC2	1-807-421-11	s	IC BH-1216
IC3	8-741-135-60	s	IC BX1356
IC4	8-759-906-59	s	IC CX22017
IC5	8-759-200-79	s	IC TC4049BF
IC6	8-759-911-77	s	IC CX7968A
IC7	1-807-421-11	s	IC BH-1216
IC8	1-807-419-11	s	IC BH-1214
IC9	1-807-418-11	s	IC BH-1213
IC10	1-807-420-12	s	IC BH-1215A
IC11	1-807-423-11	s	IC BH-1218
IC12	8-759-981-65	s	IC LM2903M
IC13	8-759-200-79	s	IC TC4049BF
L1	1-408-417-21	s	47uH
L2	1-408-417-21	s	47uH
L3	1-408-417-21	s	47uH
L4	1-408-419-00	s	68uH
L6	1-408-419-00	s	68uH
LV1	1-408-844-00	s	22uH
LV2	1-410-619-11	s	INDUCTOR, VAR 220uH
Q1	8-729-216-22	s	TRANSISTOR 2SA1162
Q2	8-729-216-22	s	TRANSISTOR 2SA1162
Q3	8-729-216-22	s	TRANSISTOR 2SA1162
Q4	8-729-100-66	s	TRANSISTOR 2SC1623
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q6	8-729-100-66	s	TRANSISTOR 2SC1623
Q7	8-729-100-66	s	TRANSISTOR 2SC1623
Q8	8-729-216-22	s	TRANSISTOR 2SA1162
Q9	8-729-100-66	s	TRANSISTOR 2SC1623
Q10	8-729-100-66	s	TRANSISTOR 2SC1623
Q11	8-729-100-66	s	TRANSISTOR 2SC1623
Q12	8-729-100-66	s	TRANSISTOR 2SC1623
Q13	8-729-100-66	s	TRANSISTOR 2SC1623
Q14	8-729-100-66	s	TRANSISTOR 2SC1623
Q15	8-729-216-22	s	TRANSISTOR 2SA1162
Q16	8-729-100-66	s	TRANSISTOR 2SC1623
Q17	8-729-100-66	s	TRANSISTOR 2SC1623
Q18	8-729-100-66	s	TRANSISTOR 2SC1623
Q19	8-729-100-66	s	TRANSISTOR 2SC1623
Q20	8-729-216-22	s	TRANSISTOR 2SA1162

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(EN-69P BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q21	8-729-100-66	s	TRANSISTOR 2SC1623
Q25	8-729-122-63	s	TRANSISTOR 2SA1226
Q26	8-729-100-66	s	TRANSISTOR 2SC1623
Q27	8-729-175-73	s	TRANSISTOR 2SC2757
Q28	8-729-100-66	s	TRANSISTOR 2SC1623
Q29	8-729-122-63	s	TRANSISTOR 2SA1226
Q30	8-729-216-22	s	TRANSISTOR 2SA1162
Q31	8-729-100-66	s	TRANSISTOR 2SC1623
Q32	8-729-216-22	s	TRANSISTOR 2SA1162
Q33	8-729-216-22	s	TRANSISTOR 2SA1162
Q34	8-729-100-66	s	TRANSISTOR 2SC1623
Q35	8-729-100-66	s	TRANSISTOR 2SC1623
R46	1-216-642-11	s	METAL CHIP 430 0.50% 1/10W
R47	1-216-642-11	s	METAL CHIP 430 0.50% 1/10W
R109	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W
R131	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R133	1-216-664-11	s	METAL CHIP 3.6K 0.50% 1/10W
RP1	1-235-528-12	s	NETWORK
RP2	1-235-528-12	s	NETWORK
RP3	1-235-526-11	s	NETWORK
RP4	1-235-527-11	s	NETWORK
RP5	1-235-526-11	s	NETWORK
RP7	1-235-527-11	s	NETWORK
RV2	1-228-459-00	s	METAL 10K
RV4	1-228-456-00	s	METAL 1K
RV5	1-228-456-00	s	METAL 1K
RV6	1-228-457-00	s	METAL 2K
RV7	1-228-457-00	s	METAL 2K
RV8	1-228-457-00	s	METAL 2K
RV11	1-228-459-00	s	METAL 10K
RV12	1-228-456-00	s	METAL 1K
RV13	1-228-473-00	s	METAL 5K
RV14	1-228-457-00	s	METAL 2K
RV15	1-228-459-00	s	METAL 10K
RV17	1-228-454-00	s	METAL 200
RV18	1-228-454-00	s	METAL 200
RV19	1-228-473-00	s	METAL 5K
RV20	1-228-456-00	s	METAL 1K
RV21	1-228-473-00	s	METAL 5K
RV22	1-228-457-00	s	METAL 2K
RV23	1-228-457-00	s	METAL 2K
S1	1-570-857-11	s	SLIDE
S2	1-570-857-11	s	SLIDE
S3	1-570-857-11	s	SLIDE

EX-108 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-253-A	o	MOUNTED CIRCUIT BOARD, EX-108
CN1	1-563-237-11	o	CONNECTOR, 40P, FEMALE
CN2	1-506-730-11	o	CONNECTOR, 40P, MALE

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

HN-135 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-995-A	o	MOUNTED CIRCUIT BOARD, HN-135
2pcs	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
1pc	1-939-724-11	o	HARNESS (AT 8P)
1pc	3-710-037-03	s	STAY, MB
CN1	1-562-147-11	o	PLUG HOUSING, 2P
CN1	1-563-239-21	o	CONNECTOR, 40P FEMALE
CN2	1-562-153-11	o	PLUG HOUSING, 8P
CN2	1-562-735-11	o	PLUG HOUSING, 2P
CN2	1-563-239-11	o	CONNECTOR, 40P, MALE
CN3	1-563-239-11	o	CONNECTOR, 40P, MALE
CN4	1-563-239-11	o	CONNECTOR, 40P, MALE
CN5	1-563-239-11	o	CONNECTOR, 40P, MALE
CN6	1-563-239-11	o	CONNECTOR, 40P, MALE
CN7	1-563-239-21	o	CONNECTOR, 40P FEMALE
CN8	1-506-635-11	o	CONNECTOR, 12P MALE
CN9	1-506-476-11	o	CONNECTOR, 11P, MALE
CN10	1-506-482-11	o	CONNECTOR, 3P, MALE
CN11	1-506-483-21	o	CONNECTOR, 4P, MALE
CN12	1-506-470-11	o	CONNECTOR, 5P, MALE
CN13	1-506-489-11	o	CONNECTOR, 10P, MALE
CN14	1-506-469-11	o	CONNECTOR, 4P, MALE
CN15	1-506-477-11	o	CONNECTOR, 12P, MALE
CN16	1-506-484-31	o	CONNECTOR, 5P, MALE
CN17	1-506-470-11	o	CONNECTOR, 5P, MALE
CN18	1-506-467-11	o	CONNECTOR, 2P, MALE
CN20	1-506-639-11	o	CONNECTOR, 20P MALE
CN21	1-506-492-11	o	CONNECTOR, 13P, MALE
CN22	1-506-485-11	o	CONNECTOR, 6P, MALE
CN23	1-506-483-21	o	CONNECTOR, 4P, MALE
CN24	1-506-468-11	o	CONNECTOR, 3P, MALE
CN25	1-506-470-11	o	CONNECTOR, 5P, MALE
CN26	1-506-467-11	o	CONNECTOR, 2P, MALE
CN27	1-506-638-11	o	CONNECTOR, 18P MALE
D1	8-719-911-19	s	DIODE 1SS119
D2	8-719-911-19	s	DIODE 1SS119
D3	8-719-911-19	s	DIODE 1SS119
D4	8-719-911-19	s	DIODE 1SS119
IC1	8-759-403-48	s	IC AN6701S

IE-25 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-989-A	o	MOUNTED CIRCUIT BOARD, IE-25
1pc	3-711-775-01	o	LEVER, PULL
C1	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C4	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C9	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C10	1-107-047-00	s	MICA 5.6PF 0.5PF 500V
C11	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C15	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C16	1-107-159-00	s	MICA 33PF 5% 500V
C19	1-107-159-00	s	MICA 33PF 5% 500V
C20	1-107-026-00	s	MICA 5.1PF 500V
C23	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C24	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C25	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C26	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C28	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C29	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C30	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C31	1-107-159-00	s	MICA 33PF 5% 500V
C34	1-107-159-00	s	MICA 33PF 5% 500V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C37	1-107-208-00	s	MICA 18PF 5% 500V
C40	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C42	1-161-896-11	s	CERAMIC 0.22MF 50V
C43	1-161-896-11	s	CERAMIC 0.22MF 50V
C44	1-124-270-11	s	ELECT, NONPOLAR 0.47uF 20% 50V
C45	1-124-270-11	s	ELECT, NONPOLAR 0.47uF 20% 50V
C46	1-161-896-11	s	CERAMIC 0.22MF 50V
C47	1-124-270-11	s	ELECT, NONPOLAR 0.47uF 20% 50V
C48	1-124-270-11	s	ELECT, NONPOLAR 0.47uF 20% 50V
C54	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C56	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C60	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C62	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C63	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C68	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C69	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C72	1-163-116-00	s	CERAMIC CHIP 91PF 5% 50V
C76	1-161-896-11	s	CERAMIC 0.22MF 50V
C79	1-107-075-00	s	MICA 39PF 5% 50V
C84	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C85	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C86	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C87	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C88	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C90	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C91	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C93	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C99	1-124-584-00	s	ELECT 100MF 20% 10V
C100	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C107	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C109	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C111	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C113	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(IE-25 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C116	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C118	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C119	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C121	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C127	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C129	1-124-286-00	s	ELECT(NONPOLAR) 33 20% 16V
C130	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C131	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C133	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C138	1-163-095-00	s	CERAMIC CHIP 12PF 5% 50V
C140	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C141	1-163-097-00	s	CERAMIC CHIP 15PF 5% 50V
C142	1-163-088-00	s	CERAMIC CHIP 5PF 0.25PF 50V
C143	1-135-168-21	s	TANTAL CHIP 100MF 10% 4V
C144	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C145	1-163-086-00	s	CERAMIC CHIP 3PF 0,25PF 50V
CN1	1-506-730-11	o	CONNECTOR, 40P, MALE
CV1	1-141-370-11	s	CAP, CHIP TRIMMER 50PF
CV2	1-141-369-22	s	CAP, CHIP TRIMMER 40PF
CV3	1-141-311-11	s	TRIMMER 20PF
CV4	1-141-370-11	s	CAP, CHIP TRIMMER 50PF
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-100-03	s	DIODE 1S2835
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-101-97	s	DIODE 1SS97-1
D5	8-719-101-97	s	DIODE 1SS97-1
D6	8-719-815-59	s	DIODE 1S1555-S
D7	8-719-100-03	s	DIODE 1S2835
D8	8-719-911-19	s	DIODE 1SS119
D9	8-719-948-47	s	DIODE HSM88AS
D10	8-719-800-76	s	DIODE 1SS123
D11	8-719-101-97	s	DIODE 1SS97-1
D12	8-719-101-97	s	DIODE 1SS97-1
D13	8-719-800-76	s	DIODE 1SS123
DL1	1-415-627-14	s	DELAY LINE 63.532uS/63.552uS
DL2	1-415-689-11	s	DELAY LINE 120nS
DL3	1-415-408-11	s	50nS, 100nS
DL4	1-415-502-11	s	100nS
FL1	1-236-520-11	s	FILTER, LOW PASS
IC1	8-759-208-06	s	IC TC4051BPHB
IC2	1-807-416-11	s	IC BH-1211
IC3	1-807-416-11	s	IC BH-1211
IC4	8-759-906-53	s	IC TL062CPS
IC5	1-807-422-11	s	IC BH-1217
IC6	8-759-906-53	s	IC TL062CPS
IC7	8-759-208-06	s	IC TC4051BPHB
IC8	8-759-200-90	s	IC TC4538BF
IC9	8-759-200-90	s	IC TC4538BF
IC10	8-759-200-68	s	IC TC4011BF
IC11	8-759-234-77	s	IC TC4S66F
L1	1-408-417-21	s	47uH
L4	1-408-421-00	s	100uH
L5	1-410-510-11	s	INDUCTOR 12uH
L6	1-408-170-00	s	INDUCTOR 18uH
L7	1-408-421-00	s	100uH

(IE-25 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q1	8-729-122-63	s	TRANSISTOR 2SA1226
Q2	8-729-122-63	s	TRANSISTOR 2SA1226
Q3	8-729-122-63	s	TRANSISTOR 2SA1226
Q4	8-729-175-73	s	TRANSISTOR 2SC2757
Q5	8-729-175-73	s	TRANSISTOR 2SC2757
Q6	8-729-109-44	s	TRANSISTOR 2SK94
Q7	8-729-175-73	s	TRANSISTOR 2SC2757
Q8	8-729-175-73	s	TRANSISTOR 2SC2757
Q9	8-729-175-73	s	TRANSISTOR 2SC2757
Q10	8-729-175-73	s	TRANSISTOR 2SC2757
Q11	8-729-175-73	s	TRANSISTOR 2SC2757
Q12	8-729-100-66	s	TRANSISTOR 2SC1623
Q13	8-729-175-73	s	TRANSISTOR 2SC2757
Q14	8-729-122-63	s	TRANSISTOR 2SA1226
Q15	8-729-175-73	s	TRANSISTOR 2SC2757
Q16	8-729-175-73	s	TRANSISTOR 2SC2757
Q17	8-729-175-73	s	TRANSISTOR 2SC2757
Q18	8-729-109-44	s	TRANSISTOR 2SK94
Q19	8-729-175-73	s	TRANSISTOR 2SC2757
Q20	8-729-175-73	s	TRANSISTOR 2SC2757
Q21	8-729-175-73	s	TRANSISTOR 2SC2757
Q22	8-729-175-73	s	TRANSISTOR 2SC2757
Q23	8-729-175-73	s	TRANSISTOR 2SC2757
Q24	8-729-122-63	s	TRANSISTOR 2SA1226
Q25	8-729-109-44	s	TRANSISTOR 2SK94
Q26	8-729-109-44	s	TRANSISTOR 2SK94
Q27	8-729-122-63	s	TRANSISTOR 2SA1226
Q28	8-729-122-63	s	TRANSISTOR 2SA1226
Q29	8-729-109-44	s	TRANSISTOR 2SK94
Q30	8-729-109-44	s	TRANSISTOR 2SK94
Q31	8-729-122-63	s	TRANSISTOR 2SA1226
Q32	8-729-122-63	s	TRANSISTOR 2SA1226
Q33	8-729-122-63	s	TRANSISTOR 2SA1226
Q34	8-729-122-63	s	TRANSISTOR 2SA1226
Q35	8-729-122-63	s	TRANSISTOR 2SA1226
Q36	8-729-122-63	s	TRANSISTOR 2SA1226
Q37	8-729-100-66	s	TRANSISTOR 2SC1623
Q38	8-729-109-44	s	TRANSISTOR 2SK94
Q39	8-729-109-44	s	TRANSISTOR 2SK94
Q41	8-729-175-73	s	TRANSISTOR 2SC2757
Q42	8-729-175-73	s	TRANSISTOR 2SC2757
Q43	8-729-175-73	s	TRANSISTOR 2SC2757
Q44	8-729-109-44	s	TRANSISTOR 2SK94
Q45	8-729-109-44	s	TRANSISTOR 2SK94
Q46	8-729-175-73	s	TRANSISTOR 2SC2757
Q47	8-729-100-66	s	TRANSISTOR 2SC1623
Q48	8-729-122-63	s	TRANSISTOR 2SA1226
Q49	8-729-122-63	s	TRANSISTOR 2SA1226
Q50	8-729-100-66	s	TRANSISTOR 2SC1623
Q51	8-729-216-22	s	TRANSISTOR 2SA1162
Q52	8-729-122-63	s	TRANSISTOR 2SA1226
Q53	8-729-175-73	s	TRANSISTOR 2SC2757
Q54	8-729-175-73	s	TRANSISTOR 2SC2757
Q55	8-729-175-73	s	TRANSISTOR 2SC2757
Q56	8-729-122-63	s	TRANSISTOR 2SA1226
Q57	8-729-122-63	s	TRANSISTOR 2SA1226
Q63	8-729-216-22	s	TRANSISTOR 2SA1162
Q65	8-729-122-63	s	TRANSISTOR 2SA1226
Q66	8-729-100-66	s	TRANSISTOR 2SC1623

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(IE-25 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q67	8-729-100-66	s	TRANSISTOR 2SC1623
Q68	8-729-175-73	s	TRANSISTOR 2SC2757
Q69	8-729-175-73	s	TRANSISTOR 2SC2757
Q70	8-729-100-66	s	TRANSISTOR 2SC1623
Q71	8-729-175-73	s	TRANSISTOR 2SC2757
Q72	8-729-122-63	s	TRANSISTOR 2SA1226
Q75	8-729-100-66	s	TRANSISTOR 2SC1623
Q76	8-729-122-63	s	TRANSISTOR 2SA1226
Q77	8-729-175-73	s	TRANSISTOR 2SC2757
Q79	8-729-100-66	s	TRANSISTOR 2SC1623
Q81	8-729-216-22	s	TRANSISTOR 2SA1162
Q82	8-729-100-66	s	TRANSISTOR 2SC1623
Q83	8-729-100-66	s	TRANSISTOR 2SC1623
Q84	8-729-175-73	s	TRANSISTOR 2SC2757
Q85	8-729-175-73	s	TRANSISTOR 2SC2757
Q89	8-729-100-66	s	TRANSISTOR 2SC1623
Q90	8-729-100-66	s	TRANSISTOR 2SC1623
Q91	8-729-122-63	s	TRANSISTOR 2SA1226
R7	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R8	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R10	1-216-647-11	s	METAL CHIP 680 0.50% 1/10W
R13	1-216-641-11	s	METAL CHIP 390 0.50% 1/10W
R14	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R28	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R29	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R32	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R33	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R34	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R45	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R59	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R60	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R63	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R79	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R80	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R81	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R82	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R88	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R89	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R91	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R93	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R94	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R108	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R109	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R110	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R127	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R128	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R129	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R147	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R148	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R161	1-216-682-11	s	METAL CHIP 20K 0.50% 1/10W
R162	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R163	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R164	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R179	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R184	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R185	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R186	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R187	1-216-664-11	s	METAL CHIP 3.6K 0.50% 1/10W

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(IE-25 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R188	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R191	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R195	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R197	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R198	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R199	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R202	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R203	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R253	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R255	1-216-042-00	s	METAL CHIP 510 5% 1/10W
R262	1-216-645-11	s	METAL CHIP 560 0.50% 1/10W
R263	1-216-636-11	s	METAL CHIP 240 0.5% 1/10W
RV1	1-228-457-00	s	METAL 2K
RV2	1-228-455-00	s	METAL 500
RV3	1-228-458-00	s	METAL 5K
RV4	1-228-471-00	s	METAL 1K
RV5	1-228-474-00	s	METAL 10K
RV6	1-228-458-00	s	METAL 5K
RV7	1-228-472-00	s	METAL 2K
RV8	1-228-470-00	s	METAL 500
RV9	1-228-458-00	s	METAL 5K
RV10	1-228-458-00	s	METAL 5K
RV11	1-228-455-00	s	METAL 500
RV12	1-228-458-00	s	METAL 5K
RV14	1-237-038-11	s	METAL 50K
RV15	1-228-455-00	s	METAL 500
RV16	1-228-454-00	s	METAL 200
RV17	1-237-033-11	s	METAL 1K
S1	1-570-610-11	s	TOGGLE
S2	1-570-857-11	s	SLIDE

LP-54 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-633-206-11	o	PRINTED CIRCUIT BOARD, LP-54
D1	8-719-812-43	s	DIODE TLG124A
D2	8-719-812-43	s	DIODE TLG124A
D3	8-719-812-43	s	DIODE TLG124A
D4	8-719-812-43	s	DIODE TLG124A
D5	8-719-812-41	s	DIODE TLR124
D6	8-719-812-44	s	DIODE TLO124
D7	8-719-812-43	s	DIODE TLG124A

LP-55 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-633-207-11	o	PRINTED CIRCUIT BOARD, LP-55
D8	8-719-915-45	s	DIODE SLP162B,RED
D9	8-719-915-45	s	DIODE SLP162B,RED
D10	8-719-909-20	s	DIODE GL-9NG2,GREEN
D11	8-719-909-20	s	DIODE GL-9NG2,GREEN

LP-56 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	3-722-474-05	o	BRACKET, LP
CN1	1-565-149-11	o	PIN, CONNECTOR (ANGLE) 2P
D1	8-719-950-44	s	DIODE GL-5LR40,RED
D2	8-719-950-44	s	DIODE GL-5LR40,RED

PA-91 BOARD

Ser. No.	40386-	BVP-70P
	41001-41262	BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	3-734-514-01	o	SUPPORT (Y)
C2	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C3	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C4	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C7	1-163-099-00	s	CERAMIC CHIP 18PF 5% 50V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C14	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C15	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C16	1-163-099-00	s	CERAMIC CHIP 18PF 5% 50V
C20	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C21	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C22	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C24	1-163-099-00	s	CERAMIC CHIP 18PF 5% 50V
C27	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C30	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C34	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C38	1-124-455-00	s	ELECT 100uF 20% 16V
C39	1-124-455-00	s	ELECT 100uF 20% 16V
C40	1-124-455-00	s	ELECT 100uF 20% 16V
C41	1-124-455-00	s	ELECT 100uF 20% 16V
C42	1-124-455-00	s	ELECT 100uF 20% 16V
C43	1-124-455-00	s	ELECT 100uF 20% 16V
C46	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN1	1-506-485-11	o	CONNECTOR, 6P, MALE
CN2	1-506-759-11	o	CONNECTOR, 15P, MALE
CN3	1-506-467-11	o	CONNECTOR, 2P, MALE
CN4	1-506-467-11	o	CONNECTOR, 2P, MALE
CN5	1-506-467-11	o	CONNECTOR, 2P, MALE
CV1	1-141-356-11	s	CAP, CHIP TRIMMER 6PF
CV2	1-141-356-11	s	CAP, CHIP TRIMMER 6PF
CV3	1-141-356-11	s	CAP, CHIP TRIMMER 6PF
Q1	8-729-122-63	s	TRANSISTOR 2SA1226
Q2	8-769-401-67	s	TRANSISTOR 3SK163-1
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-122-63	s	TRANSISTOR 2SA1226
Q5	8-769-401-67	s	TRANSISTOR 3SK163-1
Q6	8-729-100-66	s	TRANSISTOR 2SC1623
Q7	8-729-122-63	s	TRANSISTOR 2SA1226
Q8	8-769-401-67	s	TRANSISTOR 3SK163-1
Q9	8-729-100-66	s	TRANSISTOR 2SC1623
Q10	8-729-175-73	s	TRANSISTOR 2SC2757
Q11	8-729-100-66	s	TRANSISTOR 2SC1623
Q12	8-729-175-73	s	TRANSISTOR 2SC2757
Q13	8-729-100-66	s	TRANSISTOR 2SC1623
Q15	8-729-175-73	s	TRANSISTOR 2SC2757
Q16	8-729-216-22	s	TRANSISTOR 2SA1162
Q17	8-729-216-22	s	TRANSISTOR 2SA1162
Q18	8-729-122-63	s	TRANSISTOR 2SA1226
Q19	8-769-401-67	s	TRANSISTOR 3SK163-1
Q20	8-729-100-66	s	TRANSISTOR 2SC1623
Q21	8-729-122-63	s	TRANSISTOR 2SA1226

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PA-91 BOARD)

Ser. No.	40386- 41001-41262	BVP-70P BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
Q22	8-769-401-67	s	TRANSISTOR 3SK163-1
Q23	8-729-100-66	s	TRANSISTOR 2SC1623
Q24	8-729-122-63	s	TRANSISTOR 2SA1226
Q25	8-769-401-67	s	TRANSISTOR 3SK163-1
Q26	8-729-100-66	s	TRANSISTOR 2SC1623
Q27	8-729-175-73	s	TRANSISTOR 2SC2757
Q28	8-729-100-66	s	TRANSISTOR 2SC1623
Q29	8-729-175-73	s	TRANSISTOR 2SC2757
Q30	8-729-100-66	s	TRANSISTOR 2SC1623
Q32	8-729-175-73	s	TRANSISTOR 2SC2757
Q33	8-729-216-22	s	TRANSISTOR 2SA1162
Q34	8-729-122-63	s	TRANSISTOR 2SA1226
Q35	8-769-401-67	s	TRANSISTOR 3SK163-1
Q36	8-729-100-66	s	TRANSISTOR 2SC1623
Q37	8-729-122-63	s	TRANSISTOR 2SA1226
Q38	8-769-401-67	s	TRANSISTOR 3SK163-1
Q39	8-729-100-66	s	TRANSISTOR 2SC1623
Q40	8-729-122-63	s	TRANSISTOR 2SA1226
Q41	8-769-401-67	s	TRANSISTOR 3SK163-1
Q42	8-729-100-66	s	TRANSISTOR 2SC1623
Q43	8-729-175-73	s	TRANSISTOR 2SC2757
Q44	8-729-100-66	s	TRANSISTOR 2SC1623
Q45	8-729-175-73	s	TRANSISTOR 2SC2757
Q46	8-729-100-66	s	TRANSISTOR 2SC1623
Q48	8-729-216-22	s	TRANSISTOR 2SA1162
Q49	8-729-216-22	s	TRANSISTOR 2SA1162
Q50	8-729-216-22	s	TRANSISTOR 2SA1162
Q51	8-729-175-73	s	TRANSISTOR 2SC2757
Q52	8-729-216-22	s	TRANSISTOR 2SA1162
Q53	8-729-216-22	s	TRANSISTOR 2SA1162
Q54	8-729-216-22	s	TRANSISTOR 2SA1162
Q55	8-729-216-22	s	TRANSISTOR 2SA1162
R1	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R20	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R21	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R22	1-216-636-11	s	METAL CHIP 240 0.5% 1/10W
R23	1-216-636-11	s	METAL CHIP 240 0.5% 1/10W
R24	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R30	1-216-603-11	s	METAL CHIP 10 0.5% 1/10W
R31	1-216-656-11	s	METAL CHIP 1.6K 0.5% 1/10W
R35	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R52	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R54	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R55	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R56	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R57	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R58	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R64	1-216-603-11	s	METAL CHIP 10 0.5% 1/10W
R65	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R66	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R85	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R87	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W

(PA-91 BOARD)

Ser. No.	40386- 41001-41262	BVP-70P BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
R88	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R89	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R90	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R91	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R100	1-216-603-11	s	METAL CHIP 10 0.5% 1/10W
R101	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R108	1-216-698-11	s	METAL CHIP 91K 0.50% 1/10W
R109	1-216-678-11	s	METAL CHIP 13K 0.50% 1/10W
RV1	1-237-032-11	s	METAL 500
RV2	1-237-032-11	s	METAL 500
RV3	1-237-032-11	s	METAL 500

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

PA-126 BOARD (For BVP-70ISP)

Ser. No.	41263-	BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
1pc	3-734-514-01	o	SUPPORT (Y)
C2	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C3	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C4	1-163-103-00	s	CERAMIC CHIP 27PF 5% 50V
C5	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C7	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C14	1-163-103-00	s	CERAMIC CHIP 27PF 5% 50V
C15	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C16	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C20	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C21	1-163-103-00	s	CERAMIC CHIP 27PF 5% 50V
C22	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C24	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C27	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C30	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C34	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C38	1-124-455-00	s	ELECT 100MF 20% 16V
C39	1-124-455-00	s	ELECT 100MF 20% 16V
C40	1-124-455-00	s	ELECT 100MF 20% 16V
C41	1-124-455-00	s	ELECT 100MF 20% 16V
C42	1-124-455-00	s	ELECT 100MF 20% 16V
C43	1-124-455-00	s	ELECT 100MF 20% 16V
C46	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C47	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C48	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C49	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN1	1-506-485-11	o	CONNECTOR, 6P, MALE
CN2	1-506-759-11	o	CONNECTOR, 15P, MALE
CN3	1-506-467-11	o	CONNECTOR, 2P, MALE
CN4	1-506-467-11	o	CONNECTOR, 2P, MALE
CN5	1-506-467-11	o	CONNECTOR, 2P, MALE
CV1	1-141-329-21	s	CAP, CHIP TRIMMER
CV2	1-141-329-21	s	CAP, CHIP TRIMMER
CV3	1-141-329-21	s	CAP, CHIP TRIMMER
IC1	8-759-234-20	s	IC TC7S08F
IC2	8-759-234-20	s	IC TC7S08F
IC3	8-759-234-20	s	IC TC7S08F
Q1	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q2	8-765-930-08	s	TRANSISTOR 3SK163-2
Q3	8-729-802-80	s	TRANSISTOR 2SC3661
Q4	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q5	8-765-930-08	s	TRANSISTOR 3SK163-2
Q6	8-729-802-80	s	TRANSISTOR 2SC3661
Q7	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q8	8-765-930-08	s	TRANSISTOR 3SK163-2
Q9	8-729-802-80	s	TRANSISTOR 2SC3661
Q10	8-729-175-73	s	TRANSISTOR 2SC2757-T34

(PA-126 BOARD (For BVP-70ISP))

Ser. No.	41263-	BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
Q11	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q12	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q13	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q15	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q16	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q17	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q18	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q19	8-765-930-08	s	TRANSISTOR 3SK163-2
Q20	8-729-802-80	s	TRANSISTOR 2SC3661
Q21	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q22	8-765-930-08	s	TRANSISTOR 3SK163-2
Q23	8-729-802-80	s	TRANSISTOR 2SC3661
Q24	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q25	8-765-930-08	s	TRANSISTOR 3SK163-2
Q26	8-729-802-80	s	TRANSISTOR 2SC3661
Q27	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q28	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q29	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q30	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q32	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q33	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q34	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q35	8-765-930-08	s	TRANSISTOR 3SK163-2
Q36	8-729-802-80	s	TRANSISTOR 2SC3661
Q37	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q38	8-765-930-08	s	TRANSISTOR 3SK163-2
Q39	8-729-802-80	s	TRANSISTOR 2SC3661
Q40	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q41	8-765-930-08	s	TRANSISTOR 3SK163-2
Q42	8-729-802-80	s	TRANSISTOR 2SC3661
Q43	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q44	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q45	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q46	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q48	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q49	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q50	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q51	8-729-175-73	s	TRANSISTOR 2SC2757-T34
Q52	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q53	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q54	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q55	8-729-216-22	s	TRANSISTOR 2SA1162-G
R1	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R2	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R3	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R8	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R9	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R20	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R21	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R22	1-216-636-11	s	METAL CHIP 240 0.50% 1/10W
R23	1-216-636-11	s	METAL CHIP 240 0.50% 1/10W
R30	1-216-603-11	s	METAL CHIP 10 0.50% 1/10W

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PA-126 BOARD (BVP-70ISP))

Ser. No. 41263- BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
R31	1-216-656-11	s	METAL CHIP 1.6K 0.50% 1/10W
R35	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R36	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R37	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R42	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R43	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R54	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R55	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R56	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R57	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R64	1-216-603-11	s	METAL CHIP 10 0.50% 1/10W
R65	1-216-656-11	s	METAL CHIP 1.6K 0.50% 1/10W
R66	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R67	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R68	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R70	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R71	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R75	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R76	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R87	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R88	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R89	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R90	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R100	1-216-603-11	s	METAL CHIP 10 0.50% 1/10W
R101	1-216-657-11	s	METAL CHIP 1.8K 0.50% 1/10W
R108	1-216-698-11	s	METAL CHIP 91K 0.50% 1/10W
R109	1-216-678-11	s	METAL CHIP 13K 0.50% 1/10W
R110	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R111	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R112	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
RV1	1-237-032-11	s	RES, ADJ, CERMET 500
RV2	1-237-032-11	s	RES, ADJ, CERMET 500
RV3	1-237-032-11	s	RES, ADJ, CERMET 500

PR-138A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7515-116-A	o	MOUNTED CIRCUIT BOARD, PR-138A
1pc	3-711-775-01	o	LEVER, PULL
9pcs	7-627-556-37	s	SCREW, +P2.6¥4 TYPE 1
C3	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C4	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C5	1-124-499-11	s	ELECT 1MF 20% 50V
C6	1-163-035-00	s	CERAMIC CHIP 0.047MF 50V
C7	1-126-151-11	s	ELECT 4.7MF 20% 16V
C8	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C9	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C11	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C12	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C13	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C14	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C16	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C17	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C18	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C19	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C20	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C21	1-124-499-11	s	ELECT 1MF 20% 50V
C22	1-163-035-00	s	CERAMIC CHIP 0.047MF 50V
C23	1-126-151-11	s	ELECT 4.7MF 20% 16V
C24	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C25	1-163-111-00	s	CERAMIC CHIP 56PF 5% 50V
C26	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C27	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C28	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C29	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C30	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C32	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C33	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C34	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C35	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C37	1-124-499-11	s	ELECT 1MF 20% 50V
C38	1-163-035-00	s	CERAMIC CHIP 0.047MF 50V
C39	1-126-151-11	s	ELECT 4.7MF 20% 16V
C40	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C42	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C43	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C44	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C45	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C48	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C49	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C50	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C63	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C64	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C65	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C67	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C68	1-135-153-21	s	TANTALUM CHIP 2.2MF 10% 25V
C69	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C70	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C71	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C72	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C73	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C74	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-138A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C75	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C76	1-163-086-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C77	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C78	1-163-086-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C79	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C80	1-163-086-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C82	1-163-119-00	s	CERAMIC CHIP 120PF 5% 50V
C83	1-163-119-00	s	CERAMIC CHIP 120PF 5% 50V
C84	1-163-119-00	s	CERAMIC CHIP 120PF 5% 50V
C88	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C89	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C90	1-163-099-00	s	CERAMIC CHIP 18PF 5% 50V
CN1	1-506-730-11	o	CONNECTOR, 40P, MALE
CN2	1-568-614-11	o	SOCKET, SIL 3P
CN3	1-568-614-11	o	SOCKET, SIL 3P
CN4	1-568-614-11	o	SOCKET, SIL 3P
CN5	1-568-613-11	o	SOCKET, SIL 2P
CN6	1-568-615-11	s	SOCKET, SIL 4P
CN7	1-568-614-11	s	SOCKET, SIL 3P
CN8	1-568-614-11	s	SOCKET, SIL 3P
CN9	1-568-614-11	s	SOCKET, SIL 3P
CN10	1-568-612-11	o	SOCKET, SIL 1P
CN11	1-568-612-11	o	SOCKET, SIL 1P
CN12	1-568-612-11	o	SOCKET, SIL 1P
CN13	1-568-612-11	o	SOCKET, SIL 1P
CV1	1-141-331-11	s	CAP. CHIP TRIMMER 30PF
CV2	1-141-331-11	s	CAP. CHIP TRIMMER 30PF
CV3	1-141-331-11	s	CAP. CHIP TRIMMER 30PF
D3	8-719-914-13	s	DIODE HZ4CLL
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-800-76	s	DIODE 1SS226
D7	8-719-914-13	s	DIODE HZ4CLL
D8	8-719-800-76	s	DIODE 1SS226
D11	8-719-914-13	s	DIODE HZ4CLL
D12	8-719-800-76	s	DIODE 1SS226
D14	8-719-104-34	s	DIODE 1S2836
D15	8-719-800-76	s	DIODE 1SS226
D16	8-719-800-76	s	DIODE 1SS226
D17	8-719-948-47	s	DIODE HSM88AS
D18	8-719-948-47	s	DIODE HSM88AS
D19	8-719-948-47	s	DIODE HSM88AS
D28	8-719-800-76	s	DIODE 1SS226
DL1	1-415-490-21	s	180nS
DL2	1-415-490-21	s	180nS
DL3	1-415-490-21	s	180nS
DL4	1-145-449-11	s	20nS+2nS
IC1	1-807-422-11	s	IC BH-1217
IC2	8-759-906-53	s	IC TL062CPS
IC3	8-759-981-51	s	IC RC1496M
IC4	8-759-998-12	s	IC TL032CPS
IC5	1-807-422-11	s	IC BH-1217
IC6	8-759-906-53	s	IC TL062CPS
IC7	8-759-981-51	s	IC RC1496M
IC8	8-759-998-12	s	IC TL032CPS
IC9	1-807-422-11	s	IC BH-1217
IC10	8-759-906-53	s	IC TL062CPS

(PR-138A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
IC11	8-759-981-51	s	IC RC1496M
IC12	8-759-998-12	s	IC TL032CPS
IC13	8-759-009-07	s	IC MC14053BF
L1	1-408-417-00	s	47UH
L2	1-408-417-00	s	47UH
L3	1-410-709-31	s	CHIP 22UH
Q1	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q2	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q3	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q4	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q5	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q6	8-729-403-29	s	TRANSISTOR XN6435
Q7	8-729-403-29	s	TRANSISTOR XN6435
Q8	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q9	8-729-109-44	s	TRANSISTOR 2SK94X4
Q10	8-765-420-10	s	TRANSISTOR 2SK300-3-T8
Q11	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q12	8-729-403-29	s	TRANSISTOR XN6435
Q13	8-729-403-33	s	TRANSISTOR XN6534-TX
Q14	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q15	8-729-403-29	s	TRANSISTOR XN6435
Q16	8-729-403-29	s	TRANSISTOR XN6435
Q17	8-729-403-33	s	TRANSISTOR XN6534-TX
Q19	8-729-403-29	s	TRANSISTOR XN6435
Q21	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q22	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q23	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q24	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q25	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q26	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q27	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q28	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q29	8-729-403-29	s	TRANSISTOR XN6435
Q30	8-729-403-29	s	TRANSISTOR XN6435
Q31	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q32	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q33	8-765-420-10	s	TRANSISTOR 2SK300-3-T8
Q34	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q35	8-729-403-29	s	TRANSISTOR XN6435
Q36	8-729-403-32	s	TRANSISTOR XN6534
Q37	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q38	8-729-403-29	s	TRANSISTOR XN6435
Q39	8-729-403-29	s	TRANSISTOR XN6435
Q40	8-729-403-32	s	TRANSISTOR XN6534
Q42	8-729-403-29	s	TRANSISTOR XN6435
Q43	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q44	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q45	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q46	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q47	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q48	8-729-403-29	s	TRANSISTOR XN6435
Q49	8-729-403-29	s	TRANSISTOR XN6435
Q50	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q51	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q52	8-765-420-10	s	TRANSISTOR 2SK300-3-T8
Q53	8-729-175-72	s	TRANSISTOR 2SC2757-T33

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-138A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q54	8-729-403-29	s	TRANSISTOR XN6435
Q55	8-729-403-32	s	TRANSISTOR XN6534
Q56	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q57	8-729-403-29	s	TRANSISTOR XN6435
Q58	8-729-403-29	s	TRANSISTOR XN6435
Q59	8-729-403-32	s	TRANSISTOR XN6534
Q61	8-729-403-29	s	TRANSISTOR XN6435
Q62	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q63	8-729-403-32	s	TRANSISTOR XN6534
Q64	8-729-403-32	s	TRANSISTOR XN6534
Q65	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q66	8-729-403-32	s	TRANSISTOR XN6534
Q67	8-729-403-32	s	TRANSISTOR XN6534
Q68	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q69	8-729-403-32	s	TRANSISTOR XN6534
Q70	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q71	8-729-403-32	s	TRANSISTOR XN6534
Q72	8-729-122-63	s	TRANSISTOR 2SA1226-E4
Q73	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q74	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q75	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q76	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q77	8-729-100-66	s	TRANSISTOR 2SC1623-L6
Q78	8-729-403-32	s	TRANSISTOR XN6534
R4	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R5	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R7	1-216-641-11	s	METAL CHIP 390 0.50% 1/10W
R8	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R9	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R10	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R11	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R12	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R14	1-216-653-11	s	METAL CHIP 1.2K 0.50% 1/10W
R15	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R16	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R17	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R18	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R20	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R21	1-216-677-11	s	METAL CHIP 12K 0.50% 1/10W
R22	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R23	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R25	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R26	1-216-615-11	s	METAL CHIP 33 0.50% 1/10W
R27	1-216-615-11	s	METAL CHIP 33 0.50% 1/10W
R28	1-216-611-11	s	METAL CHIP 22 0.50% 1/10W
R29	1-216-630-11	s	METAL CHIP 130 0.50% 1/10W
R30	1-216-611-11	s	METAL CHIP 22 0.50% 1/10W
R31	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R32	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R33	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R36	1-216-638-11	s	METAL CHIP 300 0.50% 1/10W
R37	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R38	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R39	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R40	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R41	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R42	1-216-642-11	s	METAL CHIP 430 0.50% 1/10W
R43	1-216-619-11	s	METAL CHIP 47 0.50% 1/10W
R44	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-138A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R45	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R46	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R47	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R48	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R52	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R54	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R60	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R61	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R62	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R65	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R68	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R72	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R73	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R74	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R76	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R82	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R83	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R85	1-216-641-11	s	METAL CHIP 390 0.50% 1/10W
R86	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R87	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R88	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R89	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R90	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R92	1-216-653-11	s	METAL CHIP 1.2K 0.50% 1/10W
R94	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R95	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R96	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R97	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R98	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R99	1-216-677-11	s	METAL CHIP 12K 0.50% 1/10W
R100	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R101	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R106	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R107	1-216-615-11	s	METAL CHIP 33 0.50% 1/10W
R108	1-216-615-11	s	METAL CHIP 33 0.50% 1/10W
R109	1-216-611-11	s	METAL CHIP 22 0.50% 1/10W
R110	1-216-630-11	s	METAL CHIP 130 0.50% 1/10W
R111	1-216-611-11	s	METAL CHIP 22 0.50% 1/10W
R112	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R113	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R114	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R115	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R117	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R119	1-216-638-11	s	METAL CHIP 300 0.50% 1/10W
R120	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R121	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R122	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R123	1-216-642-11	s	METAL CHIP 430 0.50% 1/10W
R125	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R126	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R127	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R128	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R132	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R133	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R135	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W

(PR-138A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R138	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R142	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R143	1-216-619-11	s	METAL CHIP 47 0.50% 1/10W
R152	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R154	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R155	1-216-677-11	s	METAL CHIP 12K 0.50% 1/10W
R156	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R160	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R161	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R163	1-216-641-11	s	METAL CHIP 390 0.50% 1/10W
R164	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R166	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R167	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R168	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R170	1-216-653-11	s	METAL CHIP 1.2K 0.50% 1/10W
R172	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R173	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R174	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R175	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R176	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R177	1-216-677-11	s	METAL CHIP 12K 0.50% 1/10W
R178	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R180	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R181	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R182	1-216-615-11	s	METAL CHIP 33 0.50% 1/10W
R183	1-216-615-11	s	METAL CHIP 33 0.50% 1/10W
R184	1-216-611-11	s	METAL CHIP 22 0.50% 1/10W
R185	1-216-630-11	s	METAL CHIP 130 0.50% 1/10W
R186	1-216-611-11	s	METAL CHIP 22 0.50% 1/10W
R187	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R188	1-216-634-11	s	METAL CHIP 200 0.50% 1/10W
R189	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R190	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R192	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R194	1-216-638-11	s	METAL CHIP 300 0.50% 1/10W
R195	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R196	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R197	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R198	1-216-619-11	s	METAL CHIP 47 0.50% 1/10W
R199	1-216-642-11	s	METAL CHIP 430 0.50% 1/10W
R200	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R202	1-216-699-11	s	METAL CHIP 5.6K 0.50% 1/10W
R203	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R204	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R205	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R209	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R210	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R211	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R215	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R219	1-216-658-11	s	METAL CHIP 2K 0.50% 1/10W
R226	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R227	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R229	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R230	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R259	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W

(PR-138A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R260	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W
R261	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R265	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R276	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R277	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R278	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R279	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R280	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R281	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R282	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R283	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R284	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R285	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R286	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R300	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R301	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R304	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R316	1-216-106-00	s	METAL CHIP 240K 5% 1/10W
R317	1-216-104-00	s	METAL CHIP 200K 5% 1/10W
RV1	1-237-032-11	s	METAL 500
RV2	1-228-473-00	s	METAL 5K
RV3	1-237-034-11	s	METAL 2K
RV4	1-237-032-11	s	METAL 500
RV5	1-237-032-11	s	METAL 500
RV7	1-237-034-11	s	METAL 2K
RV8	1-228-474-11	s	METAL 10K
RV9	1-237-032-11	s	METAL 500
RV10	1-228-473-00	s	METAL 5K
RV11	1-237-034-11	s	METAL 2K
RV12	1-228-474-00	s	METAL 10K
RV13	1-237-032-11	s	METAL 500
RV15	1-237-035-11	s	METAL 5K
RV16	1-237-035-11	s	METAL 5K
RV17	1-237-035-11	s	METAL 5K
RV18	1-237-035-11	s	METAL 5K
RV19	1-237-035-11	s	METAL 5K
RV20	1-237-035-11	s	METAL 5K
RV22	1-228-473-00	s	METAL 5K
RV23	1-228-473-00	s	METAL 5K
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RV24	1-228-473-00	s	METAL 5K
RV25	1-228-476-00	s	METAL 50K
RV26	1-228-476-00	s	METAL 50K
RV27	1-228-476-00	s	METAL 50K
RV31	1-237-035-11	s	METAL 5K
RV32	1-228-474-00	s	METAL 10K
RV33	1-228-473-00	s	METAL 5K
RV34	1-237-032-11	s	METAL 500
S1	1-570-610-11	s	TOGGLE
S3	1-570-857-11	s	SLIDE
S4	1-570-857-11	s	SLIDE
TH1	1-807-361-11	s	THERMISTOR, POSITIVE 3.3K
TH3	1-807-361-11	s	THERMISTOR, POSITIVE 3.3K
TH5	1-807-361-11	s	THERMISTOR, POSITIVE 3.3K

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

PR-139 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C2	1-135-157-21	s	TANTALUM CHIP 10MF 10% 6.3V
C3	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C4	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C7	1-135-157-21	s	TRANTALUM CHIP 10MF 10% 6.3V
C8	1-135-091-00	s	TRANTALUM CHIP 1MF 10% 16V
C9	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C11	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C12	1-135-157-21	s	TRANTALUM CHIP 10MF 10% 6.3V
C13	1-135-091-00	s	TRANTALUM CHIP 1MF 10% 16V
C14	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C15	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN2	1-568-623-11	o	PIN, SIL 3P
CN3	1-568-623-11	o	PIN, SIL 3P
CN4	1-568-623-11	o	PIN, SIL 3P
CN5	1-568-622-11	o	PIN, SIL 2P
CN6	1-568-624-11	o	PIN, SIL 4P
CN7	1-568-623-11	o	PIN, SIL 3P
IC1	8-759-981-51	s	IC RC1496M
IC2	8-759-981-51	s	IC RC1496M
IC3	8-759-981-51	s	IC RC1496M
Q1	8-729-403-32	s	TRANSISTOR XN6534
Q2	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q3	8-729-402-19	s	TRANSISTOR XN6501
Q4	8-729-403-32	s	TRANSISTOR XN6534
Q5	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q6	8-729-402-19	s	TRANSISTOR XN6501
Q7	8-729-403-32	s	TRANSISTOR XN6534
Q8	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q9	8-729-402-19	s	TRANSISTOR XN6501
R22	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R42	1-216-693-11	s	METAL CHIP 56K 0.50% 1/10W
R43	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R62	1-216-693-11	s	METAL CHIP 56K 0.50% 1/10W
R63	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R65	1-215-433-00	s	METAL CHIP 3.3K 1% 1/6W
R66	1-215-433-00	s	METAL CHIP 3.3K 1% 1/6W
R68	1-215-433-00	s	METAL CHIP 3.3K 1% 1/6W
R69	1-216-693-11	s	METAL CHIP 56K 0.50% 1/10W
RV1	1-237-035-11	s	METAL 5K
RV2	1-237-035-11	s	METAL 5K
RV3	1-237-035-11	s	METAL 5K

PR-140 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C2	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C3	1-135-157-21	s	TANTALUM CHIP 10MF 10% 6.3V
C4	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-135-157-21	s	TANTALUM CHIP 10MF 10% 6.3V
C7	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C9	1-135-091-00	s	TANTALUM CHIP 1MF 10% 16V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-135-157-21	s	TANTALUM CHIP 10MF 10% 6.3V
C15	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C17	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C19	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C20	1-135-157-21	s	TANTALUM CHIP 10MF 10% 6.3V
C21	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
CN8	1-568-623-11	o	PIN, SIL 3P
CN9	1-568-623-11	o	PIN, SIL 3P
CN10	1-568-621-11	o	PIN, SIL 1P
CN11	1-568-621-11	o	PIN, SIL 1P
CN12	1-568-621-11	o	PIN, SIL 1P
CN13	1-568-621-11	o	PIN, SIL 1P
D1	8-719-101-97	s	DIODE 1SS97-1
D3	8-719-948-47	s	DIODE HSM88AS
D4	8-719-101-97	s	DIODE 1SS97-1
D5	8-719-101-97	s	DIODE 1SS97-1
D6	8-719-104-34	s	DIODE 1S2836
IC1	8-759-906-53	s	IC TL062CPS
IC2	8-759-906-53	s	IC TL062CPS
IC3	8-759-009-07	s	IC MC14053BF
IC4	8-759-906-53	s	IC TL062CPS
Q1	8-729-403-32	s	TRANSISTOR XN6534
Q2	8-729-403-32	s	TRANSISTOR XN6534
Q3	8-729-403-32	s	TRANSISTOR XN6534
Q4	8-729-109-44	s	TRANSISTOR 2SK94-X4
Q5	8-729-403-29	s	TRANSISTOR XN6435
R1	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
R2	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R3	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R4	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R8	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
R9	1-216-648-11	s	METAL CHIP 750 0.50% 1/10W
R10	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R11	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R17	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R18	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R19	1-216-130-11	s	METAL CHIP 2.4M 5% 1/10W
R21	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R22	1-216-672-11	s	METAL CHIP 7.5K 0.50% 1/10W
R23	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R24	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PR-140 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R25	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R26	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R27	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R30	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R31	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R32	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R34	1-216-686-11	s	METAL CHIP 30K 0.50% 1/10W
R35	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R36	1-216-656-11	s	METAL CHIP 1.6K 0.50% 1/10W
RV1	1-237-035-11	s	METAL 5K
RV3	1-237-035-11	s	METAL 5K
RV4	1-237-034-11	s	METAL 2K
RV5	1-237-034-11	s	METAL 2K
RV6	1-237-036-11	s	METAL 10K
RV7	1-237-034-11	s	METAL 2K
RV8	1-237-034-11	s	METAL 2K
RV9	1-237-034-11	s	METAL 2K
RV10	1-237-034-11	s	METAL 2K

PS-224 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7515-126-A	o	MOUNTED CIRCUIT BOARD, PS-224
1pc	3-711-775-01	o	LEVER, PULL
C3	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C4	1-162-722-11	s	CERAMIC 330PF 5% 50V
C5	1-124-479-11	s	ELECT 330MF 20% 25V
C6	1-127-519-11	s	ELECT (SOLID) 100MF 20% 20V
C7	1-136-173-00	s	FILM 0.47uF 5% 50V
C8	1-136-173-00	s	FILM 0.47uF 5% 50V
C9	1-127-519-11	s	ELECT (SOLID) 100MF 20% 20V
C10	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
C11	1-127-519-11	s	ELECT (SOLID) 100MF 20% 20V
C12	1-127-519-11	s	ELECT (SOLID) 100MF 20% 20V
C17	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-130-483-00	s	MYLAR 0.01MF 5% 50V
C19	1-131-583-11	s	TANTALUM 150uF 20% 20V
C20	1-124-140-00	s	ELECT 220MF 20% 10V
C21	1-124-120-11	s	ELECT 220MF 20% 25V
C22	1-127-515-11	s	ELECT (SOLID) 47MF 20% 10V
C25	1-127-518-11	s	ELECT (SOLID) 100MF 20% 16V
C26	1-127-515-11	s	ELECT (SOLID) 47MF 20% 10V
C27	1-127-518-11	s	ELECT (SOLID) 100MF 20% 16V
C32	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-023-00	s	CERAMIC CHIP 0.015MF 10% 50V
C37	1-124-273-00	s	ELECT, NONPOLAR 3.3uF 20% 50V
C39	1-124-270-11	s	ELECT, NONPOLAR 0.47uF 20% 50V
C40	1-124-499-11	s	ELECT 1MF 20% 50V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C42	1-124-455-00	s	ELECT 100uF 20% 16V
C45	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C46	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C48	1-124-766-00	s	ELECT, NONPOLAR 0.1uF 20% 50V
C51	1-127-519-11	s	ELECT (SOLID) 100MF 20% 20V
C52	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C56	1-162-724-11	s	CERAMIC 390PF 5% 50V
C63	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C64	1-135-149-21	s	TANTALUM CHIP 2.2MF 10% 10V
C65	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C66	1-163-113-00	s	CERAMIC CHIP 68PF 5% 50V
C67	1-135-177-21	s	TANTALUM CHIP 1MF 10% 25V
CN1	1-506-730-11	o	CONNECTOR, 40P MALE
D2	8-719-118-38	s	DIODE 1SZ46A
D3	8-719-981-00	s	DIODE ERB81-004
D4	8-719-800-76	s	DIODE 1SS123
D5	8-719-800-76	s	DIODE 1SS123
D6	8-719-942-31	s	DIODE HZ3ALL
D7	8-719-911-55	s	DIODE U05G
D9	8-719-100-05	s	DIODE 1S2837
D10	8-719-800-76	s	DIODE 1SS123
D11	8-719-908-06	s	DIODE ERA81-005
D12	8-719-908-06	s	DIODE ERA81-005
D13	8-719-908-06	s	DIODE ERA81-005
D14	8-719-908-06	s	DIODE ERA81-005
D15	8-719-908-06	s	DIODE ERA81-005
D16	8-719-908-06	s	DIODE ERA81-005
D17	8-719-908-06	s	DIODE ERA81-005

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(PS-224 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D18	8-719-908-06	s	DIODE ERA81-005
D19	8-719-951-13	s	DIODE HZ5CLL
D20	8-719-951-13	s	DIODE HZ5CLL
D21	8-719-101-97	s	DIODE 1SS97-1
D22	8-719-910-68	s	DIODE HZ6C2L
D23	8-719-100-05	s	DIODE 1S2837
D24	8-719-100-05	s	DIODE 1S2837
D26	8-719-951-13	s	DIODE HZ5CLL
D27	8-719-800-76	s	DIODE 1SS123
D28	8-719-800-76	s	DIODE 1SS123
D31	8-719-911-19	s	DIODE 1SS119
IC1	8-759-914-04	s	IC TL494CNS
IC2	8-759-981-69	s	IC LM2904M
IC3	8-759-981-69	s	IC LM2904M
IC4	8-759-906-54	s	IC TL064CNS
IC5	8-759-605-18	s	IC CX518
IC6	8-759-981-69	s	IC LM2904M
IC7	8-759-009-07	s	IC MC14053BF
L1	1-408-142-21	s	22.5MH
L2	1-408-549-00	s	150MH
L3	1-421-013-00	s	HOLIZONTAL CHOKE 25uH
L4	1-421-013-00	s	HOLIZONTAL CHOKE 25uH
L5	1-408-427-00	s	330uH
L6	1-408-423-00	s	150uH
L7	1-421-013-00	s	HOLIZONTAL CHOKE 25uH
L8	1-421-013-00	s	HOLIZONTAL CHOKE 25uH
L9	1-408-429-00	s	470uH
Q3	8-729-113-33	s	TRANSISTOR 2SB733-4
Q4	8-729-113-33	s	TRANSISTOR 2SB733-4
Q8	8-729-271-23	s	TRANSISTOR 2SC2712
Q9	8-729-600-82	s	TRANSISTOR 2SA1282-F
Q10	8-729-216-22	s	TRANSISTOR 2SA1162
Q11	8-729-177-33	s	TRANSISTOR 2SD773-4
Q12	8-729-177-33	s	TRANSISTOR 2SD773-4
Q13	8-729-807-87	s	TRANSISTOR 2SB1295-UL6
Q14	8-729-600-82	s	TRANSISTOR 2SA1282-F
Q15	8-729-177-32	s	TRANSISTOR 2SD773
Q21	8-729-271-23	s	TRANSISTOR 2SC2712
Q22	8-729-271-23	s	TRANSISTOR 2SC2712
Q23	8-729-271-23	s	TRANSISTOR 2SC2712
Q24	8-729-216-22	s	TRANSISTOR 2SA1162
Q26	8-729-800-75	s	TRANSISTOR 2SD1048X7
Q27	8-729-807-87	s	TRANSISTOR 2SB1295-UL6
Q28	8-729-807-87	s	TRANSISTOR 2SB1295-UL6
Q29	8-729-271-23	s	TRANSISTOR 2SC2712
Q31	8-729-109-44	s	TRANSISTOR 2SK94
Q35	8-729-800-75	s	TRANSISTOR 2SD1048X7
Q36	8-729-100-66	s	TRANSISTOR 2SA1623
Q37	8-729-100-66	s	TRANSISTOR 2SA1623
Q38	8-729-100-66	s	TRANSISTOR 2SA1623
Q39	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q42	8-729-216-22	s	TRANSISTOR 2SA1162-G

(PS-224 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q43	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q44	8-729-100-66	s	TRANSISTOR 2SA1623
Q45	8-729-100-66	s	TRANSISTOR 2SA1623
R55	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R71	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R72	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R73	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
R74	1-216-677-11	s	METAL CHIP 12K 0.50% 1/10W
R127	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R131	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R132	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
RV1	1-228-457-00	s	METAL 2K
RV2	1-228-456-00	s	METAL 1K
RV3	1-228-457-00	s	METAL 2K
RV4	1-228-475-00	s	METAL 20K
RV5	1-228-472-00	s	METAL 2K
RV6	1-228-461-00	s	METAL 50K
RV7	1-237-036-41	s	METAL 10K
S1	1-553-510-00	s	SLIDE
S2	1-570-857-11	s	SLIDE
T1	1-448-363-21	s	TRANSFORMER, DC-DC CONVERTER

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

RG-20P BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-584-A	o	MOUNTED CIRCUIT BOARD, RG-20
C1	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C3	1-107-019-00	s	MICA 1PF 0.5PF 500V
C4	1-107-042-00	s	MICA 2.2PF 0.5PF 500V
C6	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN1	1-506-467-11	o	CONNECTOR, 2P, MALE
CN2	1-506-472-11	o	CONNECTOR, 7P, MALE
CN3	1-506-476-11	o	CONNECTOR, 11P, MALE
CN4	1-506-467-11	o	CONNECTOR, 2P, MALE
IC1	8-759-200-79	s	IC TC4049BF
IC2	8-741-135-60	s	IC BX1356
IC3	8-759-200-81	s	IC TC4053BF
Q1	8-729-216-22	s	TRANSISTOR 2SA1162
Q2	8-729-216-22	s	TRANSISTOR 2SA1162
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
R3	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R4	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R5	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R6	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R7	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R8	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R16	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
RV1	1-228-455-00	s	METAL 500
S1	1-570-609-11	s	SWITCH, TOGGLE
S2	1-570-608-11	s	TOGGLE
S3	1-570-988-11	s	SWITCH, TOGGLE
S4	1-570-839-11	s	SLIDE

SG-143A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-994-A	o	MOUNTED CIRCUIT BOARD, SG-143AP
9pcs	3-621-124-00	o	SPACER
2pcs	3-669-595-00	s	WASHER (2), STOPPER
2pcs	3-711-767-01	s	SCREW, STOPPER
C2	1-163-133-00	s	CERAMIC CHIP 470PF 5% 50V
C4	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C5	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C7	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-162-724-11	s	CERAMIC 390PF 5% 50V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C11	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-163-035-00	s	CERAMIC CHIP 0.047MF 50V
C19	1-163-133-00	s	CERAMIC CHIP 470PF 5% 50V
C26	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C32	1-162-872-11	s	CERAMIC 51PF 5% 50V
C33	1-162-872-11	s	CERAMIC 51PF 5% 50V
C34	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C37	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C38	1-162-718-11	s	CERAMIC 220PF 5% 50V
C39	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C40	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C42	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C43	1-107-210-00	s	MICA 22PF 5% 500V
C45	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C46	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C47	1-162-673-11	s	CERAMIC 37PF 5% 50V
C48	1-163-117-00	s	CERAMIC CHIP 100PF 5% 50V
C49	1-102-951-00	s	CERAMIC 15PF 5% 50V
C51	1-163-038-00	s	CERAMIC CHIP 120PF 5% 50V
C53	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C55	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C56	1-163-011-11	s	CERAMIC CHIP 0.0015uF 10% 50V
CN1	1-506-731-21	o	CONNECTOR, 40P MALE
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-800-76	s	DIODE 1SS123
D3	8-719-948-76	s	DIODE HSM88AS
D4	8-719-921-12	s	DIODE HZ2BLL
D5	8-719-100-03	s	DIODE 1S2835
D6	8-719-100-05	s	DIODE 1S2837
D7	8-719-911-19	s	DIODE 1SS119
D8	8-719-100-03	s	DIODE 1S2835
D9	8-719-100-03	s	DIODE 1S2835
D10	8-719-948-47	s	DIODE HSM88AS
IC1	8-757-930-11	s	IC CX7930A
IC2	8-759-907-21	s	IC CX7969
IC3	8-759-009-07	s	IC MC14053BF
IC4	8-759-200-79	s	IC TC4049BF
IC5	8-759-200-79	s	IC TC4049BF
IC6	8-759-204-93	s	IC TC50H001F
IC7	8-759-906-53	s	IC TL062CPS
IC8	1-809-046-01	s	IC HYBRID
IC9	8-741-101-33	s	IC SBX1649-01
IC10	8-759-239-34	s	IC TC74HC4358AF
IC11	1-808-514-11	s	IC IB-37

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(SG-143A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
IC12	8-759-009-07	s	IC MC14053BF
IC13	1-808-513-12	s	IC IB-38
IC14	8-759-929-21	s	IC TLC27L2CPS
L1	1-408-978-21	s	INDUCTOR 47uH
L2	1-408-978-21	s	INDUCTOR 47uH
L3	1-408-417-21	s	47uH
L4	1-408-417-21	s	47uH
L5	1-408-417-21	s	47uH
L6	1-408-170-00	s	INDUCTOR 18uH
L7	1-408-417-21	s	47uH
L8	1-410-513-11	s	22uH
L9	1-410-513-11	s	22uH
L10	1-408-417-21	s	47uH
L11	1-408-417-21	s	47uH
L12	1-408-417-21	s	47uH
L13	1-410-517-11	s	INDUCTOR 47uH
Q2	8-729-216-22	s	TRANSISTOR 2SA1162
Q3	8-729-216-22	s	TRANSISTOR 2SA1162
Q4	8-729-216-22	s	TRANSISTOR 2SA1162
Q5	8-729-216-22	s	TRANSISTOR 2SA1162
Q6	8-729-175-73	s	TRANSISTOR 2SC2757
Q7	8-729-216-22	s	TRANSISTOR 2SA1162
Q8	8-729-100-66	s	TRANSISTOR 2SC1623
Q9	8-729-216-22	s	TRANSISTOR 2SA1162
R33	1-215-473-00	s	METAL 150K 1% 1/6W
R40	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R44	1-216-680-11	s	METAL CHIP 16K 0.50% 1/10W
R67	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R68	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R69	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
RV1	1-228-460-00	s	METAL 20K
RV3	1-228-474-00	s	METAL 10K
RV4	1-228-475-00	s	METAL 20K
RV5	1-228-460-00	s	METAL 20K
S1	1-553-925-00	s	ROTARY
S4	1-570-857-11	s	SLIDE
S5	1-570-857-11	s	SLIDE
S6	1-570-374-12	s	SLIDE
S7	1-570-857-11	s	SLIDE
X1	1-567-644-11	s	14.31818MHz

SW-114 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-618-176-12	o	PRINTED CIRCUIT BOARD, SW-114
R1	1-249-405-11	s	CARBON 100 5% 1/4W
S1	1-552-539-00	s	SWITCH, KEY BOARD

SW-115A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-618-175-12	o	PRINTED CIRCUIT BOARD, SW-115
CN1	1-506-469-11	o	CONNECTOR, 4P, MALE
CN2	1-506-467-11	o	CONNECTOR, 2P, MALE
D1	8-719-910-98	s	DIODE HZ9C2L
D2	8-719-911-19	s	DIODE 1SS119
D3	8-719-911-19	s	DIODE 1SS119
D4	8-719-911-19	s	DIODE 1SS119
R1	1-249-423-11	s	CARBON 3.3K 5% 1/4W
R2	1-249-429-11	s	CARBON 10K 5% 1/4W
R3	1-249-429-11	s	CARBON 10K 5% 1/4W
S1	1-554-356-00	s	SWITCH, TOGGLE
S2	1-554-400-00	s	SWITCH, TOGGLE
S3	1-554-400-00	s	SWITCH, TOGGLE
S4	1-554-356-00	s	SWITCH, TOGGLE

SW-116 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-618-177-11	o	PRINTED CIRCUIT BOARD, SW-116
CN1	1-506-484-11	o	CONNECTOR, 5P, MALE
S1	1-554-395-00	s	SWITCH, TOGGLE

SW-256 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-562-147-11	o	PLUG HOUSING, 2P
1pc	1-562-735-11	o	PLUG HOUSING, 2P
1pc	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
1pc	1-623-749-11	o	PRINTED CIRCUIT BOARD, SW-256
CN1	1-506-484-11	o	CONNECTOR, 5P, MALE
S1	1-554-396-00	s	SWITCH, TOGGLE

SW-425 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-633-210-11	o	PRINTED CIRCUIT BOARD, SW-425
CN1	1-566-393-21	o	CONNECTOR, 6P, MALE
S1	1-570-984-11	s	SWITCH, TOGGLE
S2	1-570-984-11	s	SWITCH, TOGGLE
S3	1-570-985-11	s	SWITCH, TOGGLE

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

TG-51P BOARD

Ser. No.	40386- 41001-41262	BVP-70P BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
C1	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C2	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C3	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C4	1-135-166-21	s	TANTALUM CHIP 47MF 20% 6.3V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C6	1-135-162-21	s	TANTALUM CHIP 33uF 10% 6.3VW
C7	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C9	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C11	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-163-086-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C15	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C16	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C17	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C19	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C20	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C21	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C22	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C23	1-135-166-21	s	TANTALUM CHIP 47MF 20% 6.3V
C25	1-135-160-21	s	TANTALUM CHIP 15uF 10% 16V
C26	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C27	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C28	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C29	1-135-160-21	s	TANTALUM CHIP 15uF 10% 16V
C30	1-135-160-21	s	TANTALUM CHIP 15uF 10% 16V
C31	1-135-160-21	s	TANTALUM CHIP 15uF 10% 16V
C32	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C33	1-163-105-00	s	CERAMIC CHIP 33PF 5% 50V
C35	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C38	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C39	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C45	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C46	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C49	1-135-148-21	s	TANTALUM CHIP 1.5MF 10% 16V
C51	1-135-148-21	s	TANTALUM CHIP 1.5MF 10% 16V
C52	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C53	1-135-148-21	s	TANTALUM CHIP 1.5MF 10% 16V
C54	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C55	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C56	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN1	1-566-572-11	o	CONNECTOR, 25P, MALE
CN2	1-506-470-21	o	CONNECTOR, 5P, MALE
CN3	1-506-468-11	o	CONNECTOR, 3P, MALE
CN4	1-506-475-11	o	CONNECTOR, 10P, MALE
CN5	1-563-238-11	o	CONNECTOR, 15P, FEMALE
CN6	1-563-678-21	o	CONNECTOR, BOARD TO BOARD 5P
CN7	1-563-691-21	o	CONNECTOR, BOARD TO BOARD 18P
CN8	1-506-468-11	o	CONNECTOR, 3P, MALE

(TG-51P BOARD)

Ser. No.	40386- 41001-41262	BVP-70P BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
CP1	1-567-653-21	s	28MHz
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-100-03	s	DIODE 1S2835
D3	8-719-914-12	s	DIODE HZ4BLL
D4	8-719-914-12	s	DIODE HZ4BLL
D5	8-719-914-12	s	DIODE HZ4BLL
DL1	1-415-639-11	s	DELAY LINE 10nS
IC1	8-759-145-51	s	IC CXD8002
IC2	8-752-329-33	s	IC CXD1251Q
IC4	8-759-234-20	s	IC TC7S08F
IC7	8-759-008-91	s	IC MC14023BF
IC8	8-759-234-20	s	IC TC7S08F
IC9	8-759-234-20	s	IC TC7S08F
IC10	8-759-231-30	s	IC TC4S30F
IC11	8-759-231-30	s	IC TC4S30F
IC12	8-759-231-30	s	IC TC4S30F
IC13	8-759-231-30	s	IC TC4S30F
IC15	8-759-008-67	s	IC MC14066BF
IC16	8-759-231-30	s	IC TC4S30F
IC17	8-759-231-30	s	IC TC4S30F
IC18	8-759-231-30	s	IC TC4S30F
IC19	8-759-929-21	s	IC TLC27L2CPS
IC20	8-759-929-21	s	IC TLC27L2CPS
IC21	8-759-234-20	s	IC TC7S08F
IC22	8-759-231-30	s	IC TC4S30F
IC23	8-759-234-20	s	IC TC7S08F
L1	1-408-417-21	s	47uH
L2	1-408-417-21	s	47uH
L3	1-410-703-21	s	CHIP 6.8uH
Q1	8-729-216-22	s	TRANSISTOR 2SA1162
Q2	8-729-101-25	s	TRANSISTOR 2SC1009A
Q3	8-729-101-25	s	TRANSISTOR 2SC1009A
Q4	8-729-162-44	s	TRANSISTOR 2SB624-BV4
Q5	8-729-162-44	s	TRANSISTOR 2SB624-BV4
Q6	8-729-162-44	s	TRANSISTOR 2SB624-BV4
R11	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W
R15	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W
R32	1-216-304-11	s	METAL 3.3 5% 1/10W
R33	1-216-304-11	s	METAL 3.3 5% 1/10W
R34	1-216-304-11	s	METAL 3.3 5% 1/10W
R35	1-216-304-11	s	METAL 3.3 5% 1/10W
R36	1-216-304-11	s	METAL 3.3 5% 1/10W
R37	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R38	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R39	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R40	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
R41	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
R55	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
R58	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R59	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R60	1-216-637-11	s	METAL CHIP 270 0.50% 1/10W
RV1	1-237-038-11	s	METAL 50K

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

TG-91P BOARD (for BVP-70ISP)

Ser. No.	41263-	BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
2pcs	1-590-027-11	s	SOCKET, SIL 8P
C1	1-135-216-11	s	TANTALUM CHIP 10MF 20% 10V
C2	1-163-227-11	s	CERAMIC CHIP 10PF 5% 50V
C3	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C4	1-135-216-11	s	TANTALUM CHIP 10MF 20% 10V
C5	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C7	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C9	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C10	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C11	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C14	1-163-086-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C15	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C16	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V
C17	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C19	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C20	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C21	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C22	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C23	1-135-166-21	s	TANTALUM CHIP 47MF 10% 10V
C25	1-135-160-21	s	TANTALUM CHIP 15MF 10% 16V
C26	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C27	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C28	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C29	1-135-160-21	s	TANTALUM CHIP 15MF 10% 16V
C30	1-135-160-21	s	TANTALUM CHIP 15MF 10% 16V
C31	1-135-160-21	s	TANTALUM CHIP 15MF 10% 16V
C32	1-135-159-21	s	TANTALUM CHIP 10MF 10% 20V
C35	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C38	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C39	1-163-235-00	s	CERAMIC CHIP 22PF 5% 50V
C40	1-163-227-11	s	CERAMIC CHIP 10PF 5% 50V
C41	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C45	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C46	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C49	1-135-148-21	s	TANTALUM CHIP 1.5MF 10% 16V
C51	1-135-148-21	s	TANTALUM CHIP 1.5MF 10% 16V
C52	1-135-161-21	s	TANTALUM CHIP 22MF 10% 10V
C53	1-135-148-21	s	TANTALUM CHIP 1.5MF 10% 16V
C55	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C56	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
CN1	1-566-572-11	o	CONNECTOR, 25P, MALE
CN2	1-506-470-21	o	CONNECTOR, 5P, MALE
CN3	1-506-468-11	o	CONNECTOR, 3P, MALE
CN4	1-506-475-11	o	CONNECTOR, 10P, MALE
CN5	1-563-238-11	o	CONNECTOR, 15P, FEMALE
CN6	1-563-678-21	o	CONNECTOR, BOARD TO BOARD 5P
CN7	1-563-691-21	o	CONNECTOR, BOARD TO BOARD 18P
CN8	1-506-468-11	o	CONNECTOR, 3P, MALE
CP1	1-567-550-11	s	OSCILLATOR, CRYSTAL 28MHz

(TG-91P BOARD (for BVP-70ISP))

Ser. No.	41263-	BVP-70ISP

Ref. No. or Q'ty	Part No.	SP	Description
D2	8-719-948-47	s	DIODE HSM88AS
D3	8-719-914-12	s	DIODE HZ4BLL
D4	8-719-914-12	s	DIODE HZ4BLL
D5	8-719-914-12	s	DIODE HZ4BLL
D6	8-719-948-48	s	DIODE HSM88AS-TL
DL1	1-415-776-11	s	DELAY LINE
IC1	8-759-145-51	s	IC CXD8002
IC2	8-759-148-39	s	IC CXD8095Q
IC4	8-759-234-20	s	IC TC7S08F
IC6	8-759-234-20	s	IC TC7S08F
IC7	8-759-008-91	s	IC MC14023BF
IC10	8-759-231-30	s	IC TC4S30F
IC11	8-759-231-30	s	IC TC4S30F
IC12	8-759-231-30	s	IC TC4S30F
IC13	8-759-231-30	s	IC TC4S30F
IC15	8-759-008-67	s	IC MC14066BF
IC16	8-759-231-30	s	IC TC4S30F
IC17	8-759-231-30	s	IC TC4S30F
IC18	8-759-231-30	s	IC TC4S30F
IC19	8-759-929-21	s	IC TLC27L2CPS
IC20	8-759-929-21	s	IC TLC27L2CPS
IC21	8-759-234-20	s	IC TC7S08F
IC22	8-759-231-30	s	IC TC4S30F
IC23	8-759-985-18	s	IC 74ACO8SJ
IC24	8-759-234-20	s	IC TC7S08F
L1	1-408-417-21	s	INDUCTOR 47UH
L2	1-408-417-21	s	INDUCTOR 47UH
L3	1-410-703-21	s	INDUCTOR CHIP 6.8UH
Q1	8-729-216-22	s	TRANSISTOR 2SA1162-G
Q2	8-729-101-25	s	TRANSISTOR 2SC1009A-FA4
Q3	8-729-101-25	s	TRANSISTOR 2SC1009A-FA4
Q4	8-729-141-48	s	TRANSISTOR 2SB624-BV345
Q5	8-729-141-48	s	TRANSISTOR 2SB624-BV345
Q6	8-729-141-48	s	TRANSISTOR 2SB624-BV345
R11	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W
R15	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W
R37	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R38	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R39	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R40	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
R41	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
R55	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
RV1	1-237-038-11	s	RES, ADJ, CERMET 50K

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

VA-85 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-991-A	o	MOUNTED CIRCUIT BOARD, VA-85
1pc	3-711-775-01	o	LEVER, PULL
C1	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C2	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C3	1-163-100-00	s	CERAMIC CHIP 20PF 5% 50V
C4	1-163-085-00	s	CERAMIC CHIP 2PF 0.25PF 50V
C5	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C6	1-163-085-00	s	CERAMIC CHIP 2PF 0.25PF 50V
C7	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C8	1-163-084-00	s	CERAMIC CHIP 1.5PF 0.25PF 50V
C9	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C10	1-124-269-11	s	ELECT, NONPOLAR 0.33uF 20% 50V
C11	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C13	1-135-073-00	s	TANTALUM CHIP 0.33uF 10% 35V
C14	1-126-151-11	s	ELECT 4.7uF 20% 16V
C15	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C16	1-163-113-00	s	CERAMIC CHIP 68PF 5% 50V
C17	1-163-123-00	s	CERAMIC CHIP 180PF 5% 50V
C19	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C20	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C22	1-135-156-21	s	TANTALUM CHIP 6.8uF 10% 6.3V
C25	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C26	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C27	1-163-129-00	s	CERAMIC CHIP 330PF 5% 50V
C28	1-163-100-00	s	CERAMIC CHIP 20PF 5% 50V
C29	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C30	1-163-085-00	s	CERAMIC CHIP 2PF 0.25PF 50V
C31	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C32	1-163-084-00	s	CERAMIC CHIP 1.5PF 0.25PF 50V
C33	1-163-085-00	s	CERAMIC CHIP 2PF 0.25PF 50V
C35	1-124-269-11	s	ELECT, NONPOLAR 0.33uF 20% 50V
C36	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C37	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C38	1-135-073-00	s	TANTALUM CHIP 0.33uF 10% 35V
C39	1-126-151-11	s	ELECT 4.7uF 20% 16V
C40	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C41	1-163-113-00	s	CERAMIC CHIP 68PF 5% 50V
C42	1-163-123-00	s	CERAMIC CHIP 180PF 5% 50V
C44	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C45	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C47	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C48	1-135-156-21	s	TANTALUM CHIP 6.8uF 10% 6.3V
C50	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C51	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C52	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C53	1-163-100-00	s	CERAMIC CHIP 20PF 5% 50V
C54	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C55	1-163-085-00	s	CERAMIC CHIP 2PF 0.25PF 50V
C56	1-135-159-21	s	TANTALUM CHIP 10MF 20% 16V
C57	1-163-086-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C58	1-163-085-00	s	CERAMIC CHIP 2PF 0.25PF 50V
C59	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C60	1-124-269-11	s	ELECT, NONPOLAR 0.33uF 20% 50V
C61	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C62	1-135-073-00	s	TANTALUM CHIP 0.33uF 10% 35V
C63	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C64	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V

(VA-85 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C65	1-163-113-00	s	CERAMIC CHIP 68PF 5% 50V
C66	1-163-123-00	s	CERAMIC CHIP 180PF 5% 50V
C67	1-126-151-11	s	ELECT 4.7uF 20% 16V
C68	1-163-093-00	s	CERAMIC CHIP 10PF 5% 50V
C70	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C72	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C74	1-135-164-21	s	TANTALUM CHIP 22uF 20% 10V
C75	1-135-156-21	s	TANTALUM CHIP 6.8uF 10% 6.3V
C76	1-135-125-21	s	TANTALUM CHIP 33MF 20% 10V
C77	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C78	1-126-163-11	s	ELECT 4.7MF 20% 50V
C82	1-126-160-11	s	ELECT 1MF 20% 50V
C83	1-130-471-00	s	MYLAR 0.001uF 5% 50V
C84	1-126-160-11	s	ELECT 1MF 20% 50V
C85	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C86	1-130-483-00	s	MYLAR 0.01MF 5% 50V
C89	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C91	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C93	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C95	1-163-101-00	s	CERAMIC CHIP 22PF 5% 50V
C100	1-135-125-21	s	TANTALUM CHIP 33MF 20% 10V
C102	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C103	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C104	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C105	1-161-039-00	s	CERAMIC 0.001MF 10% 25V (BVP-70P)
	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V (BVP-70ISP)
C106	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C107	1-161-039-00	s	CERAMIC 0.001MF 10% 25V (BVP-70P)
	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V (BVP-70ISP)
C108	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C109	1-161-039-00	s	CERAMIC 0.001MF 10% 25V (BVP-70P)
	1-163-141-00	s	CERAMIC CHIP 0.001MF 5% 50V (BVP-70ISP)
C110	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C111	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C112	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C113	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C114	1-130-491-00	s	MYLAR 0.047MF 5% 50V
C115	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C116	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C118	1-135-168-21	s	TANTALUM CHIP 100uF 10% 4V
C119	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C120	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C121	1-135-076-21	s	TANTALUM CHIP 1MF 10% 35V
CN1	1-506-730-11	o	CONNECTOR, 40P, MALE
CV1	1-141-370-11	s	CAP, CHIP TRIMMER 50PF
CV2	1-141-370-11	s	CAP, CHIP TRIMMER 50PF
CV3	1-141-370-11	s	CAP, CHIP TRIMMER 50PF
D1	8-719-948-47	s	DIODE HSM88AS
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-910-61	s	DIODE HZ6A1L
D5	8-719-948-47	s	DIODE HSM88AS
D7	8-719-100-03	s	DIODE 1S2835
D8	8-719-910-61	s	DIODE HZ6A1L
D10	8-719-948-47	s	DIODE HSM88AS
D12	8-719-100-03	s	DIODE 1S2835
D13	8-719-910-61	s	DIODE HZ6A1L

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VA-85 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D14	8-719-800-76	s	DIODE 1SS123
D16	8-719-800-76	s	DIODE 1SS123
DL1	1-415-184-31	s	DELAY LINE 50nS
FL1	1-409-427-11	s	FILTER, TRAP 14.3MHz
FL2	1-409-427-11	s	FILTER, TRAP 14.3MHz
FL3	1-409-427-11	s	FILTER, TRAP 14.3MHz
IC1	8-741-158-80	s	IC SBX1588-01
IC2	8-759-988-42	s	IC AD707JR
IC3	8-759-011-65	s	IC MC74HC4053F
IC4	8-759-011-65	s	IC MC74HC4053F
IC5	8-759-208-06	s	IC TC4051BPHB
IC6	8-741-158-80	s	IC SBX1588-01
IC7	8-759-988-42	s	IC AD707JR
IC8	8-759-011-65	s	IC MC74HC4053F
IC9	8-759-011-65	s	IC MC74HC4053F
IC10	8-759-208-06	s	IC TC4051BPHB
IC12	8-741-158-80	s	IC SBX1588-01
IC13	8-759-988-42	s	IC AD707JR
IC14	8-759-011-65	s	IC MC74HC4053F
IC15	8-759-208-06	s	IC TC4051BPHB
IC16	8-759-908-92	s	IC TL084CNS
IC17	8-759-987-41	s	IC SN74HC4066NS
IC18	8-759-208-11	s	IC TC4053BFHB
IC19	8-759-208-11	s	IC TC4053BFHB
IC20	8-759-906-54	s	IC TL064CNS
IC21	8-759-208-11	s	IC TC4053BFHB
IC22	8-759-906-54	s	IC TL064CNS
IC23	8-759-908-17	s	IC TL082CPS
IC24	8-759-011-65	s	IC MC74HC4053F
IC25	8-759-925-74	s	IC SN74HC04NS
IC26	8-759-911-04	s	IC TL068CLP
Q1	8-729-216-22	s	TRANSISTOR 2SA1162
Q2	8-729-100-66	s	TRANSISTOR 2SC1623
Q3	8-729-122-63	s	TRANSISTOR 2SA1226
Q4	8-729-122-63	s	TRANSISTOR 2SA1226
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q7	8-729-122-63	s	TRANSISTOR 2SA1226
Q8	8-729-175-73	s	TRANSISTOR 2SC2757
Q9	8-729-175-73	s	TRANSISTOR 2SC2757
Q10	8-729-100-66	s	TRANSISTOR 2SC1623
Q11	8-729-216-22	s	TRANSISTOR 2SA1162
Q12	8-729-100-66	s	TRANSISTOR 2SC1623
Q13	8-729-122-63	s	TRANSISTOR 2SA1226
Q14	8-729-122-63	s	TRANSISTOR 2SA1226
Q15	8-729-100-66	s	TRANSISTOR 2SC1623
Q17	8-729-122-63	s	TRANSISTOR 2SA1226
Q18	8-729-175-73	s	TRANSISTOR 2SC2757
Q19	8-729-175-73	s	TRANSISTOR 2SC2757
Q20	8-729-216-22	s	TRANSISTOR 2SA1162
Q21	8-729-100-66	s	TRANSISTOR 2SC1623
Q22	8-729-122-63	s	TRANSISTOR 2SA1226
Q23	8-729-122-63	s	TRANSISTOR 2SA1226
Q24	8-729-100-66	s	TRANSISTOR 2SC1623
Q25	8-729-100-66	s	TRANSISTOR 2SC1623
Q27	8-729-122-63	s	TRANSISTOR 2SA1226
Q28	8-729-175-73	s	TRANSISTOR 2SC2757
Q29	8-729-175-73	s	TRANSISTOR 2SC2757
Q30	8-729-216-22	s	TRANSISTOR 2SA1162

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VA-85 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q31	8-729-216-22	s	TRANSISTOR 2SA1162
Q32	8-729-216-22	s	TRANSISTOR 2SA1162
Q33	8-729-216-22	s	TRANSISTOR 2SA1162
Q34	8-729-216-22	s	TRANSISTOR 2SA1162
Q38	8-729-100-66	s	TRANSISTOR 2SC1623
Q39	8-729-122-63	s	TRANSISTOR 2SA1226
Q40	8-729-100-66	s	TRANSISTOR 2SC1623
Q41	8-729-122-63	s	TRANSISTOR 2SA1226
Q42	8-729-122-63	s	TRANSISTOR 2SA1226
Q43	8-729-100-66	s	TRANSISTOR 2SC1623
Q44	8-729-216-22	s	TRANSISTOR 2SA1162
Q45	8-729-109-44	s	TRANSISTOR 2SK94
Q46	8-729-216-22	s	TRANSISTOR 2SA1162
R1	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R3	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R6	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R9	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R10	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R13	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R15	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R16	1-216-626-11	s	METAL CHIP 91 0.50% 1/10W
R18	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R21	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R22	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R23	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R29	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R30	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R32	1-216-052-00	s	METAL CHIP 1.3K 5% 1/10W
R34	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R35	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R36	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R38	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R41	1-216-647-11	s	METAL CHIP 680 0.50% 1/10W
R43	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R46	1-216-647-11	s	METAL CHIP 680 0.50% 1/10W
R47	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R50	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R54	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R55	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R58	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R59	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R61	1-216-626-11	s	METAL CHIP 91 0.50% 1/10W
R63	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R68	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R69	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R70	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R74	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R75	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R77	1-216-052-00	s	METAL CHIP 1.3K 5% 1/10W
R79	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R80	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R81	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R83	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R86	1-216-647-11	s	METAL CHIP 680 0.50% 1/10W
R88	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R89	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R91	1-216-668-11	s	METAL CHIP 5.1K 0.50% 1/10W
R92	1-216-653-11	s	METAL CHIP 1.2K 0.50% 1/10W
R94	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W

(VA-85 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R98	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R99	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R102	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R105	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R109	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R110	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R111	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R112	1-216-626-11	s	METAL CHIP 91 0.50% 1/10W
R114	1-216-661-11	s	METAL CHIP 2.7K 0.50% 1/10W
R118	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R119	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R120	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R127	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R128	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R130	1-216-052-00	s	METAL CHIP 1.3K 5% 1/10W
R134	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R135	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R136	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R139	1-216-647-11	s	METAL CHIP 680 0.50% 1/10W
R144	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R150	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R157	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R178	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R201	1-215-482-00	s	METAL 360K 1% 1/6W
R227	1-216-092-00	s	METAL CHIP 62K 5% 1/10W
R229	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R230	1-216-699-11	s	METAL CHIP 100K 0.50% 1/10W
R241	1-216-034-00	s	METAL 240 5% 1/10W
R242	1-247-883-00	s	CARBON (SMALL) 150K 5% 1/4W
R246	1-216-034-00	s	METAL 240 5% 1/10W
R247	1-247-882-11	s	CARBON (SMALL) 130K 5% 1/4W (BVP-70P)
	1-216-100-00	s	CHIP 130K 5% 1/10W (BVP-70ISP)
R253	1-216-034-00	s	METAL 240 5% 1/10W
R254	1-247-882-11	s	CARBON (SMALL) 130K 5% 1/4W (BVP-70P)
	1-216-100-00	s	CHIP 130K 5% 1/10W (BVP-70ISP)
R266	1-215-493-00	s	METAL 1M 1% 1/6W
R267	1-215-493-00	s	METAL 1M 1% 1/6W
R268	1-215-491-00	s	METAL 820K 1% 1/6W
RV1	1-228-471-00	s	METAL 1K
RV4	1-228-458-00	s	METAL 5K
RV5	1-228-459-00	s	METAL 10K
RV6	1-228-471-00	s	METAL 1K
RV7	1-228-474-00	s	METAL 10K
RV8	1-228-474-00	s	METAL 10K
RV10	1-228-458-00	s	METAL 5K
RV11	1-228-459-00	s	METAL 10K
RV12	1-228-471-00	s	METAL 1K
RV13	1-228-474-00	s	METAL 10K
RV16	1-228-458-00	s	METAL 5K
RV17	1-228-459-00	s	METAL 10K
RV18	1-228-475-00	s	METAL 20K
RV19	1-228-460-00	s	METAL 20K
RV20	1-228-475-00	s	METAL 20K
RV21	1-228-460-00	s	METAL 20K
RV22	1-228-475-00	s	METAL 20K
RV23	1-228-460-00	s	METAL 20K
RV24	1-228-462-00	s	METAL 100K
RV25	1-228-462-00	s	METAL 100K

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VA-85 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
RV26	1-228-462-00	s	METAL 100K
RV27	1-228-462-00	s	METAL 100K
RV28	1-228-462-00	s	METAL 100K
RV29	1-228-462-00	s	METAL 100K
RV30	1-228-462-00	s	METAL 100K
RV31	1-228-462-00	s	METAL 100K
RV32	1-228-462-00	s	METAL 100K
RV33	1-228-462-00	s	METAL 100K
RV34	1-228-462-00	s	METAL 100K
RV35	1-228-462-00	s	METAL 100K
RV36	1-228-462-00	s	METAL 100K
RV37	1-228-462-00	s	METAL 100K
RV38	1-228-462-00	s	METAL 100K
RV39	1-228-462-00	s	METAL 100K
RV40	1-228-462-00	s	METAL 100K
RV41	1-228-462-00	s	METAL 100K
RV42	1-228-462-00	s	METAL 100K
RV43	1-228-462-00	s	METAL 100K
RV44	1-228-462-00	s	METAL 100K
RV50	1-228-456-00	s	METAL 1K
RV51	1-228-456-00	s	METAL 1K
RV52	1-228-456-00	s	METAL 1K
RV53	1-228-458-00	s	METAL 5K
RV54	1-228-458-00	s	METAL 5K
RV55	1-228-458-00	s	METAL 5K
S1	1-570-857-11	s	SLIDE
S2	1-570-610-11	s	TOGGLE
S3	1-572-446-21	s	SWITCH, ROTARY
S4	1-570-857-11	s	SLIDE

VF-41 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-475-A	o	MOUNTED CIRCUIT BOARD, VF-41
C1	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C2	1-135-125-21	s	TANTALUM CHIP 33uF 20% 10V
C4	1-135-155-21	s	TANTALUM CHIP 4.7uF 20% 10V
C6	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C7	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C8	1-163-115-00	s	CERAMIC CHIP 82PF 5% 50V
C10	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C11	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C12	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C15	1-136-534-11	s	FILM 0.0027uF 5% 100V
C16	1-136-287-11	s	FILM 0.0047uF 5% 100V
C17	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C18	1-163-021-00	s	CERAMIC CHIP 0.01MF 10% 50V
C19	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C20	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C21	1-164-350-11	s	CERAMIC 470PF 10% 1KV
C22	1-126-233-11	s	ELECT 22uF 20% 35V
C23	1-163-833-00	s	CERAMIC CHIP 0.068uF 25V
C25	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C26	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C27	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C28	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C29	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C30	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C31	1-135-091-00	s	TANTALUM CHIP 1uF 20% 16V
C32	1-163-019-00	s	CERAMIC CHIP 0.0068MF 10% 50V
C33	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C34	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C35	1-136-287-11	s	FILM 0.0047uF 5% 100V 25V
C36	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C37	1-163-037-11	s	CERAMIC CHIP 0.022uF 10% 25V
C38	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C39	1-135-076-21	s	TANTALUM CHIP 1uF 10% 35V
C40	1-163-017-00	s	CERAMIC CHIP 0.0047MF 10% 50V
C41	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C42	1-135-092-21	s	TANTALUM CHIP 3.3uF 20% 16V
C43	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C44	1-163-133-00	s	CERAMIC CHIP 470PF 5% 50V
C45	1-135-159-21	s	TANTALUM CHIP 10uF 20% 16V
C46	1-126-176-11	s	ELECT 220uF 20% 10V
C47	1-124-455-00	s	ELECT 100uF 20% 16V
C48	1-163-038-00	s	CERAMIC CHIP 0.1MF 25V
C49	1-163-109-00	s	CERAMIC CHIP 47PF 5% 50V
C50	1-163-125-00	s	CERAMIC CHIP 220PF 5% 50V
C51	1-163-018-00	s	CERAMIC CHIP 0.0056uF 10% 50V
C52	1-163-121-00	s	CERAMIC CHIP 150PF 5% 50V
CN1	1-566-395-11	o	CONNECTOR, 10P, MALE
CN2	1-566-391-11	o	CONNECTOR 12P
CN4	1-506-470-11	o	CONNECTOR, 5P, MALE
CN5	1-506-470-11	o	CONNECTOR, 5P, MALE
CV1	1-141-370-11	s	CAP, CHIP TRIMMER 50PF
D1	8-719-914-11	s	DIODE HZ4ALL
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-900-95	s	DIODE V09G
D5	8-719-901-19	s	DIODE V11N
D6	8-719-900-95	s	DIODE V09G

(VF-41 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D7	8-719-104-31	s	DIODE 1S2838
D8	8-719-104-31	s	DIODE 1S2838
D9	8-719-800-76	s	DIODE 1SS226
D10	8-719-800-76	s	DIODE 1SS226
D11	8-719-104-31	s	DIODE 1S2838
D12	8-719-910-75	s	DIODE HZ7B2L
D13	8-719-104-34	s	DIODE 1S2836
DL1	1-415-487-11	s	DELAY LINE 140nS
IC1	8-759-300-28	s	IC HA11423MP
IC2	8-759-100-94	s	IC UPC358G2
IC3	8-759-209-57	s	IC TC4S69F
IC4	8-759-209-54	s	IC TC4S01F
L2	1-459-899-11	s	COIL, HORIZONTAL LINEARITY
L3	1-410-716-31	s	INDUCTOR CHIP 82uH
Q1	8-729-175-72	s	TRANSISTOR 2SC2757
Q2	8-729-175-72	s	TRANSISTOR 2SC2757
Q3	8-729-175-72	s	TRANSISTOR 2SC2757
Q4	8-729-175-72	s	TRANSISTOR 2SC2757
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q6	8-729-105-37	s	TRANSISTOR 2SC3360
Q7	8-729-100-66	s	TRANSISTOR 2SC1623
Q8	8-729-119-00	s	TRANSISTOR 2SK612
Q9	8-729-119-00	s	TRANSISTOR 2SK612
Q10	8-729-105-37	s	TRANSISTOR 2SC3360
Q11	8-729-100-66	s	TRANSISTOR 2SC1623
Q12	8-729-216-22	s	TRANSISTOR 2SA1162
Q13	8-729-175-72	s	TRANSISTOR 2SC2757
Q14	8-729-100-66	s	TRANSISTOR 2SC1623
Q15	8-729-216-22	s	TRANSISTOR 2SA1162
Q16	8-729-162-43	s	TRANSISTOR 2SB624-BV3
Q17	8-729-109-44	s	TRANSISTOR 2SK94
Q18	8-729-216-22	s	TRANSISTOR 2SA1162
R3	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R4	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R5	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R6	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R8	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R10	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R11	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R12	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R14	1-216-637-11	s	METAL CHIP 270 0.50% 1/10W
R15	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R16	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
R17	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R19	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R20	1-216-645-11	s	METAL CHIP 560 0.50% 1/10W
R22	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R23	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
R25	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R26	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R27	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R28	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R32	1-216-698-11	s	METAL CHIP 91K 0.50% 1/10W
R43	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R46	1-215-490-00	s	METAL 750K 1% 1/6W
R79	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R81	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VF-41 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R82	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R85	1-216-668-11	s	METAL CHIP 5.1K 0.50% 1/10W
R86	1-216-693-11	s	METAL CHIP 56K 0.50% 1/10W
R87	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R91	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R92	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R93	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R97	1-208-259-00	s	METAL 10M 10%
RV1	1-237-035-11	s	METAL 5K
RV2	1-237-035-11	s	METAL 5K
RV3	1-237-035-11	s	METAL 5K
RV4	1-237-041-11	s	METAL 500K
RV5	1-237-035-11	s	METAL 5K
RV6	1-237-031-11	s	METAL 200
RV7	1-237-032-11	s	METAL 500
RV8	1-237-032-11	s	METAL 500
RV9	1-237-038-11	s	METAL 50K
T1	1-439-419-11	s	TRANSFORMER, FLYBACK
VDR1	1-806-497-00	s	VARISTOR ERZ-C05DK220

VR-108 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-476-A	o	MOUNTED CIRCUIT BOARD, VR-108
C7	1-135-092-21	s	TANTALUM CHIP 3.3uF 20% 16V
C8	1-163-037-11	s	CERAMIC CHIP 0.022uF 10% 25V
CN23	1-506-485-11	o	CONNECTOR, 6P, MALE
IC1	8-759-801-06	s	IC LB1423N
Q1	8-729-901-03	s	TRANSISTOR DTC144WK
Q2	8-729-901-03	s	TRANSISTOR DTC144WK
Q3	8-729-901-03	s	TRANSISTOR DTC144WK
Q4	8-729-901-03	s	TRANSISTOR DTC144WK
R15	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
RV1	1-238-296-11	s	RES, VAR, CARBON 10K
RV2	1-238-296-11	s	RES, VAR, CARBON 10K
RV3	1-238-290-11	s	RES, VAR, CARBON 1K
RV4	1-238-293-11	s	RES, VAR, CARBON 10K
RV5	1-228-473-00	s	RES, ADJ, METAL 5K

MAIN FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-466-158-13	s	CONVERTER UNIT, DC-DC
1pc	1-547-360-11	o	FILTER UNIT, OPTICAL
1pc	1-937-212-21	o	HARNESS (VF)
1pc	1-937-218-11	o	HARNESS (LENS)
1pc	1-939-723-15	o	HARNESS(50P PC BOARD TYPE)
1pc	8-759-947-34	s	IC LM35DZ
CN1F(to CN-189 board)			
	1-562-743-11	o	HOUSING, 10P
CN1F(to DC-DC CONV)			
	1-562-152-11	o	HOUSING, 7P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN1F(to PA-91 board)			
	1-562-151-11	o	HOUSING, 6P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN1F(to RG-20/20P board)			
	1-562-147-11	o	HOUSING, 2P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN1F(to SW-116A board)			
	1-562-150-11	o	HOUSING, 5P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN1F(to SW-256 board)			
	1-562-150-11	o	HOUSING, 5P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN2F(to CN-304 board)			
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
CN2F(to TG-51/51P board)			
	1-562-150-21	o	HOUSING, 5P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN3F(to AT-58 board)			
	1-562-151-11	o	HOUSING, 6P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN3F(to DR-86 board)			
	1-562-154-11	o	HOUSING, 9P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN3F(to RG-20/20P board)			
	1-562-156-11	o	HOUSING, 11P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN3F(to TG-51/51P board)			
	1-562-148-11	o	HOUSING, 3P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN3F(to CN-304 board)			
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
CN3F(to PA-91 board)			
	1-562-147-11	o	HOUSING, CONNECTOR 2P
	1-563-088-11	o	CONTACT, FEMALE, AWG24-30
	1-562-735-11	o	HOUSING, CONNECTOR 2P

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(MAIN FRAME)

Ref. No. or Q'ty	Part No.	SP	Description
CN4F(to AT-58 board)			
	1-562-148-11	o	HOUSING, 3P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN4F(to RG-20/20P board)			
	1-562-147-11	o	HOUSING, 2P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN4F(to CN-304 board)			
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
CN4F(to PA-91 board)			
	1-562-147-11	o	HOUSING, CONNECTOR 2P
	1-563-088-11	o	CONTACT, FEMALE, AWG24-30
	1-562-735-11	o	HOUSING, CONNECTOR 2P
CN4F(to TG-51/51P board)			
	1-562-155-11	o	HOUSING, 10P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN5F(to CN-304 board)			
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
CN5F(to PA-91 board)			
	1-562-147-11	o	HOUSING, CONNECTOR 2P
	1-563-088-11	o	CONTACT, FEMALE, AWG24-30
	1-562-735-11	o	HOUSING, CONNECTOR 2P
CN6F(to CN-304 board)			
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
CN7F(to CN-304 board)			
	1-565-129-11	o	HOUSING, 10P
	1-565-164-11	o	CONTACT, FEMALE AWG26-32
CN8F(to HN-135 board)			
	1-563-120-11	o	HOUSING, PS 12P
	1-563-115-11	o	CONTACT, FEMALE AWG24-28
CN8F(to TG-51/51P board)			
	1-562-148-11	o	HOUSING, PS 3P
	1-563-058-11	o	CONTACT, FEMALE AWG24-28
CN9F(to HN-135 board)			
	1-562-156-11	o	HOUSING, 11P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN10F(to HN-135 board)			
	1-562-148-11	o	HOUSING, 3P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN11F(to HN-135 board)			
	1-562-149-11	o	HOUSING, 4P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN12F(to HN-135 board)			
	1-562-150-11	o	HOUSING, 5P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN13F(to HN-135 board)			
	1-562-155-11	o	HOUSING, 10P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN14F(to HN-135 board)			
	1-562-149-11	o	HOUSING, 4P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.

(MAIN FRAME)

Ref. No. or Q'ty	Part No.	SP	Description
CN15F(to HN-135 board)			
	1-562-157-11	o	HOUSING, 12P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN16F(to HN-135 board)			
	1-562-150-21	o	HOUSING, 5P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN17F(to HN-135 board)			
	1-562-150-11	o	HOUSING, 5P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN18F(to HN-135 board)			
	1-562-147-11	o	HOUSING, 2P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN20F(to HN-135 board)			
	1-563-124-11	o	HOUSING, PS 20P
	1-563-115-11	o	CONTACT, FEMALE AWG24-28
CN21F(to HN-135 board)			
	1-562-627-11	o	HOUSING, 13P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN22F(to HN-135 board)			
	1-562-151-11	o	HOUSING, 6P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN23F(to HN-135 board)			
	1-562-149-11	o	HOUSING, 4P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN24F(to HN-135 board)			
	1-562-148-11	o	HOUSING, 3P
	1-563-088-11	o	CONTACT, FEMALE AWG24-30
CN27F(to HN-135 board)			
	1-563-123-11	o	HOUSING, PS 18P
	1-563-115-11	o	CONTACT, FEMALE AWG24-28
CN101	1-565-051-11	o	CONNECTOR, 20P FEMALE "VF"
CN102	1-562-221-21	s	CONNECTOR, 12P FEMALE "LENS"
CN103	1-562-261-21	o	CONNECTOR, BNC "TEST OUT"
CN105	1-561-233-21	s	CONNECTOR, 6P FEMALE "REMOTE"
CN110M	1-562-855-11	o	HOUSING, IL 6P
	1-564-092-11	o	CONTACT, MALE AWG22-28
CN110F	1-561-518-00	o	HOUSING, ILG 6P
	1-560-372-00	o	CONTACT, FEMALE AWG22-28
RV101	1-223-165-00	s	RES, ADJ, WIREWOUND 10K"PEDESTAL"

VIEWFINDER FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-542-106-11	s	MICROPHONE
1pc	⚠ 1-546-066-21	s	1.5" CRT ASSY
1pc	1-940-868-12	s	HARNESS(VF CABLE)
CN1F(to LP-56 board)			
	1-565-121-11	o	HOUSING, 2P
	1-564-832-11	o	CONTACT
CN1F(to SW-425 board)			
	1-563-871-11	o	HOUSING, 6P
	1-563-869-11	o	CONTACT
CN1F(to VF-41 board)			
	1-563-873-11	o	HOUSING, 10P
	1-563-869-11	o	CONTACT
CN2F(to VF-41 board)			
	1-563-874-11	o	HOUSING, 12P
	1-563-869-11	o	CONTACT, FEMALE
CN4F(to VF-41 board)			
	1-562-150-11	o	HOUSING, 5P
	1-564-026-21	o	CONTACT
CN5F(to VF-41 board)			
	1-562-150-11	o	HOUSING, 5P
	1-564-026-21	o	CONTACT
CN11F(to CN-440 board)			
	1-563-877-11	o	HOUSING, 18P
	1-563-869-11	o	CONTACT, FEMALE
CN13F(to CN-440 board)			
	1-563-873-11	o	HOUSING, 10P
	1-563-869-11	o	CONTACT
CN14F(to VR-108 board)			
	1-563-872-11	o	HOUSING, 8P
	1-563-869-11	o	CONTACT, FEMALE
CN23F(to VR-108 board)			
	1-562-151-11	o	HOUSING, 6P
	1-563-088-11	o	CONTACT, FEMALE AWG26-30
CN102F(to MICROPHONE)			
	1-562-151-11	o	HOUSING, 6P
	1-563-088-11	o	CONTACT, FEMALE AWG26-30

PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP	Description
(FOR BVP-70)			
	A-7401-157-A	s	PAD ASSY (2)
	A-7520-253-A	o	MOUNTED PCB, EX-108
	X-3710-001-3	o	LID ASSY, UPPER
	3-657-705-00	s	BOLT(M4X40), HEXAGON HOLE
	3-675-930-00	s	CAP (50P PIN SIDE), DUST
	3-687-116-01	o	WASHER(4), STOPPER
	3-692-589-01	s	TOOL
	3-711-780-01	s	COVER, RAIN
	3-717-823-01	s	COVER, BNC
	3-720-955-02	s	LID, VF MICROPHONE
	7-721-140-60	s	WRENCH, L (3.0MM)
(FOR BVW-570)			
	A-7401-157-A	s	PAD ASSY (2)
	A-7520-253-A	o	MOUNTED PCB, EX-108
	X-3710-001-3	o	LID ASSY, UPPER
	3-675-930-00	s	CAP (50P PIN SIDE), DUST
	3-692-589-01	s	TOOL
	3-711-780-01	s	COVER, RAIN
	3-720-955-02	s	LID, VF MICROPHONE
	3-676-269-00	s	CAP(50P SOCKET SIDE), DUST
	3-698-917-01	o	BELT, SHOULDER
	3-711-708-01	o	CUSHION
	3-717-823-01	s	COVER, BNC
	3-718-047-01	s	CAP, 4P DROP PROTECTION
	4-332-293-00	s	BAG, PROTECTION
	7-682-559-09	s	SCREW, +B4X5
	7-721-140-60	s	WRENCH, L (3.0MM)

Please see pages D-19 to D-21 for the part numbers of capacitors and resistors that are not listed in the parts list.